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WILDLIFE REVIEW

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Bibliography

Blake, S. F., and Alice C. Atwood. Geographical guide to floras of the world. An annotated list with special reference to useful plants and common plant names: Pt. 1, Africa, Australia, North America, South America, and islands of Atlantic, Pacific, and Indian Oceans, U. S. Dept. of Agriculture, Misc. Publ. 401 (Superintendent of Documents, Washington, D. C. Clothbound, 75 cents a copy), 336 pp., 1942.

Selected list of floras and floristic works relating to vascular plants, including bibliographies and publications dealing with useful plants and vernacular names. The entries, grouped as general and local under each geographic heading, are briefly annotated. Terminal sections give in full the names of periodicals cited, and an author index. A scholarly work of immense and lasting value.

Conservation: Bighorn

Spencer, Clifford. Bighorns on the march, American Forests (919 Seventeenth St., N. W., Washington, D. C. 50 cents a copy), 48(6), June 1942, pp. 250-253, 285, illus.

History and habits of a herd on the Pike National Forest, Colorado. Twice this band has been known to suffer severe losses: in 1885 apparently from scabies, and in 1923-24 from an unnamed disease. Nevertheless 500 animals are now present and the example is an encouraging one to those trying to restore bighorns. The advantages of this herd are: suitable environment, little predation or poaching, and the protective sentiment of nearby ranchers.

Conservation: Bighorn, Texas

Davis, Wm. B., and Walter P. Taylor. The Texas bighorn, Texas Agr. Expt. Sta. (College Station), Progress Report 560, 2 pp. (mimeographed), 1940.

Map showing past and present distribution of the animal in the State, a matter discussed in the text. Competition with sheep and goats, and sharing their diseases, are factors responsible for decline of the bighorns.

Conservation: In Poland

Borucki, Jul. The preservation of nature in pre-war Poland, Bul. British Ornithologists' Club (C. Carmichael Low, 7 Kent House, Kensington Court, London, W. 8, England), 62(440), pp. 19-27, Dec. 1941.

As early as 1423, royal edicts protected the elk, the wild horse, and the great yew forests. Other early conservation is briefly outlined. After Poland's revival in 1919 a Committee for the Preservation of Nature was set up and in 1925, the State Council for Nature Preservation was organized. A law passed in 1934 enabled practical effect to be given to the decisions of the Council. By 1937, natural parks covering an area of 24,000 acres had been established; there were also 180 small reservations protected for their

outstanding beauty or the occurrence of interesting plants and animals. There were in addition hundreds of monuments for single notable amenities. The author describes some of the larger parks and tells of their distinctive features; he refers to increasing tourist travel to them before the present war, and to national publications associated with the conservation movement. The mammals and birds especially protected are mentioned and a popular movement for bird and other nature study is recorded. A Swiss authority said, "When one considers the attitude of the school towards the protection of Wild Nature, Poland is at the head of all civilized countries." The philosophy of nature protection is ably discussed. The author deals, of course, with pre-war conditions; much of the work may be and probably is ruined now. In conclusion, he says, "This was the state of affairs until September 1939, and the title of my lecture is actually an epitaph. But the principles remain. These were sound, and as long as principles exist there will always be men to follow them and to keep them alive. I think after this war we shall again go to work to preserve what is left of our country's most precious heritage, the beauty and the splendour with which Nature endowed her."

Conservation: In state parks

Holmes, J. S. Wildlife on state parks, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 6(7), July 1942, pp. 6-7, 13, 2 photos.

The policies stated are much like those prevailing on National parks: Animals dangerous to the public are kept under control; no birds are considered predators and no mammals are looked upon as vermin; instead of killing off one species to favor another, nature should be allowed to do her own regulation; the introduction of non-indigenous species should not be tolerated; caged animals have no place in state parks; in a word, natural conditions should be interfered with as little as possible.

Conservation: International

Hayden, Sherman S. The international protection of wildlife. Columbia University Press (New York, N. Y.), 246 pp., 4 graphs, 1942.

"This is an enquiry into man's protection of animals through the device of international agreements or treaties." The introduction shows the need for protection of wildlife against ruthless exploitation and sketches the beginnings of international conservation. In similar fashion, the author discusses preservation of natural communities in Africa and Pan-America, the protection of birds, and the conservation of marine animals. The conclusions are not optimistic and since he drew them, war has shattered international agreements. The text of 9 of these are reproduced as appendices. There is a 12-page bibliography and a full index.

These sentiments from the author's conclusion seem those inevitable from any comprehensive review of the field of wildlife conservation. "When I undertook this work, I hoped to set forth more significant results and more promising conclusions than the facts turn out to permit. In each case the remedy has fallen short of the need, in some cases tragically so, and always

for the same reasons--the active opposition of a few, who fear the danger to their killing rights, and the blank indifference of the many. Achievement has measured up neither to need nor to hopes."

Conservation: Waterfowl

Lowe, Percy R., et al. International wildfowl inquiry. Vol. 1. Factors affecting the general status of wild geese and wild duck. Cambridge University Press (American agency, The Macmillan Co., 60 Fifth Ave., New York, N. Y. $2.25 a copy), 123 pp., 1941.

Report of The International Committee for Bird Preservation (British Section) consisting of 8 chapters by a total of 21 authors. Time seems "out of joint" with this attempt to improve international bird protection, yet carrying on for the sake of the ideal is praiseworthy. The Chairman states that for 50 years or so there has been a steady diminution in the world's stock of Anatidae. However, in writing that the first indication that all was not well was the constant bickerings about the stock shared by the United and Canada, he emphasizes the discord and neglects the much greater cooperation between these countries, and forgets his decade earlier prophecy that without international protection, the "European ducks and waders are doomed." This introductory chapter refers to American conditions at the lowest ebb of the waterfowl population, uses it as a horrible example, and ignores the improvement that has since taken place and the methods by which it was achieved. It is to be hoped that the information collected from Eurasian countries is more up-to-date and applicable. Factors held contributory to the world-wide diminution in wild fowl are: Increased facilities of travel and transport; cold storage and commercialization (the United States is given credit for not participating in this); destruction of eggs and molting birds by native populations on far northern breeding grounds; ill-considered reclamation of marsh lands and other factors connected with agriculture; silting up of estuaries, inlets, etc.; decrease in food plants; punt-gunning and shooting from mechanically-propelled boats; disturbance by airplanes; and allowing shooting over too long seasons, especially in spring.

Chapters by members of the Committee and others expressing more fully the claims of the Chairman as to the hazards to waterfowl and containing other unsummarized information, are entitled: Conditions in northern breeding areas of wildfowl; the distribution of Zostera and other seashore plants in relation to the migrations of wildfowl (Dr. R. W. Butcher says: "In spite of all that has been written on the subject x x x the cause of the disappearance of Zostera still remains to be found."); British and Dutch decoys (i.e. duck traps); and punt-gunning (i.e. with swivel-guns). There are two chapters devoted to the ringing (called banding on this side) of waterfowl and the information thereby obtained. Close time is the subject of another essay, in which the British law is quoted and to which is appended a table showing closed seasons for the principal species of ducks and geese in 26 European countries. A book full of meat, which despite present international severance, will greatly influence future attempts at conservation. Criticisms arising from our different point of view should be tempered by the realization that all is not perfect in either knowledge or conservation of waterfowl in the Americas.

Volume 2 in this series, "The status and distribution of wild geese and wild duck in Scotland," by John Berry, termed "the first attempt to put on record a distributional index and a practical estimate of a country's total stock of wildfowl," is obtainable from the same source.

Control: Aquatic weeds

Wilber, C. P. Aquatic weed control, Parks & Recreation (327 W. Jefferson St., Rockford, Ill. 25 cents a copy), 25(8), April 1942, pp. 296-299.

A lake in Sussex County, N. J., of about 195 acres was choked with vegetation, mainly Potamogeton robbinsii and Brasenia schreberi. Treated areas (45-50 acres) were freed of aquatic growth by two applications of a commercial preparation (Benoclor 3). Spraying in moderate dosage and treating limited areas at a time allowing opportunity for fishes to escape held destruction of these animals to a minimum. The spraying apparatus and procedure are described.

Control: Biological

Shelford, V. E. Biological control of rodents and predators, Scientific Monthly (Lancaster, Pa. 50 cents a copy), 55(4), Oct. 1942, pp. 331-341, 3 figs.

Points to the extent and success of efforts to control insect pests by biological means and to the failure to try analagous methods in the control of mammalian pests. Discusses the fauna of western grasslands and its treatment by trappers, hunters, stockmen, and farmers. Indicates the possibilities of biological control and the desirability of research on grassland ecology. The summary and conclusions of the article are: "(1) Biological control of pest mammals has never been tried; (2) the essential species are still available but greatly reduced and declining so that a point of extinction may be reached reasonably soon; (3) the several tracts of land of suitable size and present use are available at low cost. A part of each is already publicly owned; (4) the value of rodents as soil builders renders retention of natural populations under biological control in the best interest of soil fertility and the production of grasses; (5) the restoration of the plains fauna on a large tract is desirable from the standpoint of its preservation in a wild state; (6) a large reservoir is needed as a check for lands under management, Such a tract can form a basis for an adjacent biological laboratory for the study of biological problems, evolution, hormones in nature, the origin of pest populations, etc."

Control: Fortification of squill

Crabtree, D. Glen, Justus C. Ward, and F. E. Garlough. The fortification of red squill (Urginea maritima) by means of an extract of red squill, Journ. Amer. Pharmaceutical Assoc. Scientific Edition (20th & Northampton Sts., Easton, Pa. 35 cents a copy), 31(5), May 1942, pp. 142-144, 2 figs., 1 table.

Red squill, though at its best a most satisfactory rat poison, varies greatly in potency. This paper reports upon experiments conducted to obtain a more standardized product. The method is repeated extraction with 80 percent alcohol, concentration of the extract, and blending of the concentrate with sufficient raw squill to produce the strength desired. This product is dried and powdered for use. The solvent is recovered and used again. The method is adapted to either large or small scale operation.

Control: Rat

Venables, L. S. V., and P. H. Leslie. The rat and mouse populations of corn ricks, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, N.W. 1, London, England. 20 shillings a copy), 11(1), May 1942, pp. 44-68, 1 pl., 3 figs., 6 tables.

Report on an investigation by questionary and field study designed to throw light upon control problems. Rat infestations were high, mean numbers per stack varying from 18 to 57. The corn rick is "a habitat of major importance in the ecology of country rat populations." Large numbers of mice also may be present with the rats. Gassing with cyanide powder killed only about a third of the rats in two stacks. Protection by fencing or stacking on staddles is impractical and uneconomical. Vernacular and scientific names are given for all of the animals discussed. Bibliography of 13 titles.

Control: Rodent

Krauch, Hermann. Control of rodents in Douglas-fir cut-over stands relatively more important than seed supply, Southwestern Forest and Range Expt. Sta. (Tucson, Ariz.), Research Notes 100, 2 pp., 1 table (mimeographed), May 1942.

Discussion of results obtained on experimental plots at Cloudcroft Forest. Best results for both sowed and non-sowed plots were obtained where rodents had been controlled. The inference, therefore, was that successful regeneration depends more on rodents being effectively controlled than it does upon the seed supply. Leaflets 97 and 98, April 1942, by the same author, treat other phases of the subject.

Control: Rodent, Natural

Elton, Charles. The natural control of rodent populations, Proc. Sixth Pacific Science Congress (University of California Press, Berkeley), 5, 1940, pp. 109-114.

The need for control of rodents on account of their economic destructiveness and their carrying of human diseases, especially in view of modern facility of transport, is urged but the author calls for more attention to animal population dynamics in planning and carrying out control measures. As overpopulations of rodents always subside, whatever method of control is used gets the credit. Each situation, however, requires analysis. Cycles occur where influence by man is entirely absent, proving that action by man is not necessary to subsidence in a rodent population. The development of census methods will enable the controller to get knowledge of the increase of rodent

populations before the levels at which damage is reported and to apply control before the animals become seriously destructive. The efficiency of control methods should be scientifically ascertained. The mechanisms of cycles need further study. Suggestions are made of applicable methods. In conclusion the author says, "It appears to me that the purely technical aspects of such research should present no more difficulties than many much more difficult achievements in applied science. The method would perhaps make it possible to apply planned moderate control over very wide areas at a low cost, and to sterilize completely areas where there is exceptionally serious danger from rodents. By a system of this kind it would be possible to iron out fluctuations to some extent, to retain moderate numbers without complete extermination (which is undesirable from many points of view), and apply rational control in the light of definite knowledge of the habits and population dynamics of the various species."

Control: Seed spot protection

Keyes, Joseph, and Clarence F. Smith. Seed spot protection with screens for the pines of California. 11 pp., 3 tables (mimeographed), 1942.

Domes stamped from 3-mesh, 21-gage, galvanized iron, hardware cloth were efficiently and economically used to protect seed spots. This leaflet was issued in only a small edition, with the expectation of offering the material later to the Journal of Forestry. A few copies without illustrations are available through E. R. Kalmbach, Fish and Wildlife Service, Custom House, Denver, Colo. War-time restrictions upon zinc coating necessitate change to some other material--a modification that has not yet been worked out.

Control: Snail, Brown

Lewis, H. C., and J. R. La Follette. Control of the brown snail in citrus orchards, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 35(3), pp. 359-362, 3 tables.

The introduced Helix aspersa damages citrus fruit and foliage. The control methods used are discussed in relation to habits of the snails and the experiments made are described. Authors' summary: "Poison baits consisting of bran, or substitutes, with calcium arsenate or metaldehyde, alone or in combination, have been used for control of the European brown snail in California citrus orchards. Orchard experiments and observations have shown that: (1) Arsenical baits are somewhat more effective than metaldehyde baits; (2) metaldehyde baits are relatively ineffective when broadcast and are less effective during cold weather. When used they should be placed in small piles in the sunshine; (3) the season for best control is rainy weather in late winter and spring when snails are most active; (4) arsenical baits should be broadcast onto the trees, and this method of application is essential during the period when greatest tree damage is being done by immature snails; (5) fresh-pressed orange pulp, a citrus by-product, with calcium arsenate, is the most effective bait yet tried."

Control: Trapping

Young, Stanley P. The steel wolf trap in North America, Western Sportsman (1009 Seventeenth St., Denver, Colo. 15 cents a copy), 6(3), Feb. 1941, pp. 10-11, 30-31, 8 photos.

History of the development of the steel trap in America.

Control: Weed trees

Pessin, L. J. Recommendations for killing scrub oaks and other undesirable trees, Southern Forest Expt. Sta. (New Orleans, La.), Occasional Paper 102, 5 pp., 1 fig. (mimeographed), May 1942.

Author's summary: "Three methods of killing scrub oaks were recently tested in southern Mississippi. These included: (1) Cutting trees above and below the surface of the ground, (2) girdling the stems at the base by removing the bark and by killing the cambium and the bark with flames from a blow torch, and (3) poisoning. Most of the trees that were cut produced vigorous sprouts. Girdling or removing a strip of bark around the base of the tree for a distance of about one foot above ground yielded fairly satisfactory results. Although the crowns died slowly no sprouts developed from either the root collar or the stem. This method, although costly and requiring very careful work, is recommended where it is unsafe to use poison. Burning the butts of the trees with a blow torch proved too ineffective for practical use. The most successful and cheapest method tested consisted of injecting sodium arsenite into the roots or stems of trees, through the use of a tool developed especially for this purpose. Most of the trees so treated died in a relatively short time. Caution is needed in the use of sodium arsenite. The poison is deadly to both animals and plants and should be handled with extreme care."

Cycles

Elton, Charles. Voles, mice, and lemmings. Oxford University Press (Amen House, E.C. 4, London, England. Also obtainable at an American office, 114 Fifth Avenue, New York, N. Y. $10.00 a copy), 2+496 pp., frontispiece, 22 figs., 64 tables, June 1942.

From author's preface: "The materials of this book have been assembled slowly for sixteen years with the help of a great many people x x x The first part is a panorama of vole and mouse plagues in those countries for which records are available. The second part describes the vole and mouse fluctuations that occur in Great Britain and Scandinavia, and the methods developed at Oxford for the study of population dynamics in the field and laboratory. The third and fourth parts contain the history of similar fluctuations in Northern Labrador and Ungava that have an important influence upon the fur trade and the life of natives." The chapters, each accompanied by a list of literature cited, review an immense amount of historical and zoological lore. The author's comments throughout show an admirable regard for proportion and reveal an abiding sense of humor that prevents him from taking anything too seriously. This latter quality, it probably was that kept him from attaching himself to any of the schools of explanations of

cycles. As a rule the facts are left to speak wholly for themselves. Considerably more than half of the volume relates to American animals and their cycles: foxes and voles in Labrador; caribous, foxes, and lemmings in Ungava. Undoubtedly this book is the indispensable foundation for further effective study of cycles. It is well organized, thoroughly documented, and satisfactorily indexed.

Cycles: Muskrat

Elton, Charles, and Mary Nicholson. Fluctuations in numbers of the muskrat (Ondatra zibethica) in Canada, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, N.W. 1, London, England. 20 shillings a copy), 11(1), May 1942, pp. 96-126, 21 figs., 9 tables.

Brief reference to cycles in the population of other Canadian mammals and birds and to hypotheses as to their causes. Previous work is described and a bibliography of 27 titles presented. Data used in the present paper were drawn from fur returns, fur sales, and annual reports of the Hudson's Bay Company and from records of the Dominion Bureau of Statistics. These are tabulated, graphed, and discussed in relation to climatic factors and other possible causes of mortality. From the authors' summary: "Analysis of fur sales and fur returns of the muskrat (Ondatra zibethica) in the nineteenth and twentieth centuries, together with a questionnaire enquiry to fur posts in Canada, shows that there has been, since about 1850 at any rate, a strongly marked cycle in numbers of muskrats with an average period of recurrence of about ten years. x x x The ten-year cycle in muskrats has a very wide geographical range, right across Canada, and it runs parallel with the similar cycle in numbers of snowshoe rabbits (Lepus americanus), and various terrestrial fur-bearing animals, game birds and raptorial birds. The presence of parallel cycles in aquatic and terrestrial species in the same region affords strong evidence for the existence of some climatic factor controlling these different population rhythms."

Destruction

Beard, Daniel B., et al. Fading trails. The story of endangered American wildlife. (The Macmillan Co., 60 Fifth Ave., New York, N. Y. $3.00 a copy), xv+279 pp., 32 line and wash drawings and 4 colored plates by Walter A. Weber. 1942.

Other members of the Committee preparing this book were Frederick C. Lincoln, Hartley H. T. Jackson, Victor H. Cahalane, and Ben H. Thompson. It was edited by Charles Elliott. The primitive state of wildlife on the continent, exploitation of this resource, extinctions, and progress in conservation of remaining forms are considered in introductory chapters. The following sections of the book are devoted to still endangered forms: mammals, birds, reptiles, and fishes, as well as one crustacean, the lobster. A closing chapter mentions numerous other animals "close to the shadows". There is a 5-page bibliography and an index. A timely and well-done work.

Diseases and Parasites: Acanthocephala, Filicollis

Perry, Mary Louise. A new species of the acanthocephalan genus Filicollis, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(5), Oct. 1942, pp. 385-388, 1 pl., 1 fig.

Filicollis altmanni; original description, measurements, illustrations; from scoters (Melanitta spp.); California. Heavy infestations probably the cause of death.

Diseases and Parasites: Acarina, Dermacentor

Howell, Darill E. The ecology of Dermacentor albipictus (Packard), Proc. Sixth Pacific Science Congress (University of California Press, Berkeley, Calif.), 4, 1940, pp. 439-458.

Hosts (including deer, moose, elk, mountain goat, and beaver); distribution; life history. Bibliography of 9 titles.

Diseases and Parasites: Acarina, Hypodectes

Spurlock, G. M., and J. T. Emlen, Jr. Hypodectes chapini n. sp. (Acarina) from the red-shafted flicker, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(4), Aug. 1942, pp. 341-344, 1 fig.

Summary of previous work on the genus, which "is used to designate immature forms for which the adult stages may be unknown." Original description, illustration. Davis, Calif. Bibliography of 11 titles.

Diseases and Parasites: Acarina, Ixodes

Gregson, J. D. A new species of tick found on shrews, Canadian Entomologist (Prof. A. W. Baker, Ontario Agricultural College, Guelph, Ontario), 74(8), Aug. 1942, pp. 137-139, 1 pl.

Ixodes soricis n. sp. from shrews of the genus Sorex collected in British Columbia; description, measurements, illustrations. Comparison with I. angustus which occurs on squirrels, rabbits, moles, rats, mice, chipmunks, and dogs, as well as on shrews.

Diseases and Parasites: Acarina, Trombiculinae

Radford, Charles D. The larval Trombiculinae (Acarina, Trombidiidae) with descriptions of twelve new species, Parasitology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 18 shillings, 6 pence a copy), 34(1), May 1942, pp. 55-81, 106 figs.

Catalogue of described forms with host and locality records. Key to 15 genera (4 new), based on larval characters. Bibliography of 48 titles.

Diseases and Parasites: Anoplura

Jellison, Wm. L. Host distribution of lice on native American rodents north of Mexico, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 245-250, 1 table.

Distribution of the parasites as evidence of geographic origin of the hosts. Bibliography of 16 titles.

Diseases and Parasites: Aspergillosis

Meade, Gordon M., and Dayton Stoner. Aspergillosis in a snowy owl, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 59(4), Oct. 1942, pp. 577-578, Pl. 18.

Macro- and micro-scopic lesions of a specimen taken near Albany, N. Y.

Diseases and Parasites: Botulism

Coburn, Don R. Concerning the nature of type C botulinus toxin fractions, Science (Lancaster, Pa. 15 cents a copy), 95(2467), April 10, 1942, pp. 389-390.

Fraction A consisting of ammonia salts is a quick acting neuro-toxin. It is volatile on boiling but very stable at room temperatures. Removal of this fraction from the whole toxin evolved by bacterial growth leaves a residue which is no longer toxic by oral administration but is still toxic by injection. It probably does not exist in a free state in nature as it is destroyed by strong alkali. This may account for occasional field samples that show the differential toxicity stated.

Diseases and Parasites: Cestoda, Catenotaenia

McIntosh, Allen. A new dilepidid cestode, Catenotaenia linsdalei, from a pocket gopher in California, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 8(2), July 1941, pp. 60-62, figs.

Description, illustration; notes on previously described species of the genus.

Diseases and Parasites: Cestoda, Mesocestoides

Chandler, Asa C. Mesocestoides manteri n. sp. from a lynx, with notes on other North American species of Mesocestoides, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(3), June 1942, pp. 227-231, 4 figs.

Original description, measurements, illustrations (Nebraska); comparative notes; bibliography of 6 titles.

Diseases and Parasites: Chagas' disease

Wood, Sherwin F. Observations on vectors of Chagas' disease in the United States. I. California, Bul. Southern Calif. Acad. Sci. (Los Angeles County Museum, Exposition Park, Los Angeles, Calif. 50 cents a copy), 41(2), May-Aug. 1942, pp. 61-69, 2 tables.

Records of Trypanosoma from California rodents; only one record, from a wood rat, was definitely of T. cruzi. This species has however been identified in cone-nosed bugs (Triatoma) from 4 or 5 localities. Bibliography of 21 titles.

Diseases and Parasites: Coccidiosis

Herman, Carlton M., and Harry Jankiewicz. Reducing coccidiosis in California quail during captivity, Calif. Fish & Game (Terminal Id., Calif.) 28(3), July 1942, pp. 148-149, Fig. 44.

If the birds are kept in wire-bottomed cages, they rapidly become free of the disease which apparently depends for its continuance upon frequent reinfection. Description and illustrations of the oocysts.

Diseases and Parasites: Coccidiosis

Herman, Carlton M., Harry A. Jankiewicz, and Roy H. Saarni. Coccidiosis in California quail, Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 44(4), July-Aug. 1942, pp. 168-171, 3 tables.

Review of literature, 8 titles of which are cited. Authors' summary: "The presence of coccidian infection in California Quail at the San Joaquin Experimental Range, Madera County, California, has been reported from an examination of the fecal droppings of 121 birds over a period of four months. Infection was noted in 89 birds. Percentages of infection have been given for adult and immature quail and for males and females. A rise and fall in intensity of infection was observed in individual birds at different samplings. An analysis was made of monthly incidence of infection, with a decrease noted from April to August, suggesting a possibility of seasonal variation. A higher percentage of infection seems evident in female birds. Coccidian infection was noted in 11 individual birds other than quail, representing 7 species, from the same locality."

Diseases and Parasites: Foot-and-mouth disease

Bullough, W. S. Starling movements and the spread of foot-and-mouth disease, Nature (Macmillan & Co. Ltd., St. Martin's St., London, W.C. 2, England. 1 shilling, 6 pence a copy), 149(3790), June 20, 1942, pp. 683-685, 3 figs.

Unless a natural reservoir exists, it would seem that reintroductions of the disease must occur because each epidemic is so vigorously suppressed. When an unusually large outbreak of the disease occurs on the Continent, it appears to spread to England at the autumn migration time. Starlings migrate

from the mainland to Great Britain, and their communal roosting and radiating feeding habits make it plausible that they are connected with the spread of foot-and-mouth disease on the island. Distribution and numerical occurrence of starlings are analyzed and seem to be correlated with outbreaks of the malady. The evidence, however, is merely circumstantial. The author concludes: "It is difficult to see how proof or disproof of a thesis that the starling is an important carrier of foot-and-mouth disease can be obtained, and certainly many factors other than the starling must be involved in greater or lesser degree. Latitude, weather, and several species of birds may exert an effect, and possibly also there exists in some species of wild mammal a natural reservoir of disease although, if this last contention is correct, it is difficult to understand why many more outbreaks do not occur." Bibliography of 7 titles.

Diseases and Parasites: Foot-worm disease

DeNio, Reginald M., and Raymond M. West. The foot-worm disease in deer of the northern Rocky Mountain region, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 40(7), July 1942, pp. 540-543, 2 figs., 1 table.

"An important disease of deer and elk in the northern Rocky Mountain region recently has been discovered. The disease is known to occur only in western Montana, but it may have a far wider distribution. The cause of the disease and its symptoms are described." The foot-worm parasite is the nematode, Onchocerca cervipedis. Authors' conclusions: "While no exhaustive study has been made of this disease, the work to date justifies the following conclusions: (1) The disease is confined almost entirely to whitetail and mule deer; 19 percent of the 424 deer examined were infected; (2) the highest rate of occurrence is in adult animals; and 69 percent of the infected adults were males; (3) this disease is not the foot-rot of domestic sheep. No reports have been recorded of this foot-worm being found in domestic sheep. The identification of this parasite also differentiates the disease from the foot and mouth disease, Cytoryctes aphtharum, of domestic animals."

Diseases and Parasites: Haematozoa

Fanthan, H. B., Annie Porter, and L. R. Richardson. Some Haematozoa observed in vertebrates in eastern Canada, Parasitology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 18 shillings, 6 pence a copy), 34(2), July 1942, pp. 190-226, Pls. 2-4.

Original descriptions of numerous new species from fishes, frogs, and toads. Bibliography of 36 titles.

Diseases and Parasites: Lead poisoning

Adler, F. E. W. The problem of lead poisoning in waterfowl, Wisconsin Conservation Bulletin (Wisconsin Conservation Department, Madison), 7(9), Sept. 1942, pp. 5-7.

Lead poisoning in waterfowl noted as far back as 1894 and observations on the disease were made in Texas and in Washington in 1908. In the United States thousands of ducks and geese die each year from this cause, the heaviest mortality occurring in late fall and early spring. Of 6,471 diving duck stomachs analyzed in the Biological Survey in 1937, 9.52 percent contained lead shot. Symptoms and lesions of the poisoning are described. Due to difficulty of manufacture, alloy shot, though effective in preventing poisoning, are not a practical means of combating the malady. Selection of shot-free areas as refuges and provision of adequate supplies of grit are recommended.

Diseases and Parasites: Linguatulidae

Penn, George H., Jr. The life history of Porocephalus crotali, a parasite of the Louisiana muskrat, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(4), Aug. 1942, pp. 277-283, 2 figs.

Synonymy, hosts of adults (crotaline snakes), life history, description, illustrations. Principal host of the adult in Louisiana, the cotton-mouth moccasin; nymphs only occur upon the muskrat. Bibliography of 6 titles.

Diseases and Parasites: Malaria

Stauber, Mabel F., and Leslie A. Stauber. Bird malaria in southern New Jersey, Proc. 29th Ann. Meeting N. J. Mosquito Control Assoc. (Dr. T. J. Headlee, Dayton, N. J.), 1942, pp. 45-46.

Detected in only 5 birds of 3 species in a collection of 155 individuals representing 15 species. Discussion of findings. There is a brief review by F. C. Bishopp and H. H. Stage of world work on bird malaria on pp. 130-131 of the same volume.

Diseases and Parasites: Nematoda, Ascaridia

Wehr, Everett E. The occurrence in the United States of the turkey ascarid, Ascaridia dissimilis, and observations on its life history, Proc. Helminthological Society of Washington (Edna M. Buhrer, U. S. Horticultural Station, Beltsville, Md.), 9(2), July 1942, pp. 73-74.

Georgia, Pennsylvania. Comparison with the chicken ascarid, and life history notes.

Diseases and Parasites: Nematoda, Crenosoma

Goble, Frans C. Crenosoma zederi n. sp. (Nematoda: Metastrongyloidea), a new lungworm from the skunk (Mephitis nigra), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(5), Oct. 1942, pp. 381-384, 1 pl.

New York; description, illustrations, comparative notes.

Diseases and Parasites: Nematoda, Crenosoma

Wallace, F. G. Crenosoma microbursa n. sp. from the skunk, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 8(2), July 1941, pp. 58-60, figs.

Minnesota; description, illustration, comparative notes; key to 6 species. Bibliography of 9 titles.

Diseases and Parasites: Nematoda, Dracunculus

Chandler, Asa C. The Guinea worm, Dracunculus insignis (Leidy 1858), a common parasite of raccoons in east Texas, Amer. Journ. Tropical Medicine (Williams & Wilkins Co., Baltimore, Md. $1.50 a copy), 22(2), March 1942, pp. 153-157, 1 fig.

Examinations and reports indicate that foot infection is common. Description and illustration of this parasite and comparison with congeners. Review of previous records in North America; 10 bibliographical references appended. Notes are given also on distribution in other lands and on human infections.

Diseases and Parasites: Nematoda, Oxyuridae

Walton, A. C. Some oxyurids from a Galapagos tortoise, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 9(1), Jan. 1942, pp. 1-17, 1 pl.

The paper contains a key to 14 genera of the family that occur in reptiles, a host list of the species (some from the United States) assigned to these genera, and a bibliography of 72 titles.

Diseases and Parasites: Nematoda, Physalopterinae

Morgan, B. B. A summary of the Physalopterinae (Nematoda) of North America, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 8(1), Jan. 1941, pp. 28-30.

Discussion of value of taxonomic characters in the subfamily in which 4 genera are recognized. A list is given of 21 species and of their American hosts (terrestrial vertebrates). A supplementary paper (ibid. 8(2), July 1941, pp. 63-64) gives host records for worms of the same subfamily that were immature or that were identified only as to genus.

Diseases and Parasites: Nematoda, Skrjabinema

Dikmans, G. A new nematode, Skrjabinema parva (Nematoda: Oxyuroidea), from deer, Proc. Helminthological Soc. of Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 9(2), July 1942, pp. 66-68, figs., table.

Idaho. Notes on previously described species of the genus; tabulation of measurements of 6 of them, equally divided between 2 subgenera; description, illustration.

Diseases and Parasites: Nematoda, Thelazia

Herde, Karl E. A new spiruroid nematode, Thelazia buteonis, from Swainson's hawk, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(3), June 1942, pp. 241-244, 1 pl.

Original description, measurements, illustrations (Oklahoma); comparative notes on 20 avian and 11 mammalian parasites of the same genus. Bibliography of 17 titles.

Diseases and Parasites: Pentastomida

Brues, Charles T. Occurrence of Porocephalus crotali Humboldt in Florida, Ohio Journ. Science (Dr. John A. Miller, Botany & Zoology Bldg., Ohio State University, Columbus. 50 cents a copy), 42(3), May 1942, p. 112.

From a water moccasin (Agkistrodon piscivorus); history of knowledge of the group; previous records of the species; bibliography of 6 titles.

Diseases and Parasites: Plague

Anon. The black death is here, Time (330 East 22nd St., Chicago, Ill. 15 cents a copy), 40(8), Aug. 24, 1942, pp. 52, 54, 1 cartoon.

Plague occurs among rodents in States from North Dakota and Colorado westward. The name sylvatic plague is a misleading euphemism. The disease is identical with the historic black death and may spread throughout the eastern United States. Historic epidemics in Europe are reviewed. In 1900 the disease reached this country probably through ship-borne rats from Honolulu. In the next two years, 113 persons are known to have died from it in San Francisco. "Today the U.S. owes its permanent plague menace to California's indomitable chamber of commerce spirit. In 1901 California's Governor, business interests and press denied the plague ever existed." However, it was present, continued to kill people, and spread among the rodents. "It might have been exterminated in 1905; in 1934 it was too late." Wild rodent-sylvatic plague is everlasting and permanent," says Dr. Karl F. Meyer, "Americans will have to learn to live with the plague."

Diseases and Parasites: Plague

Anon. Plague infection reported in the United States during 1941, U.S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(24), June 12, 1942, pp. 903-905, 1 table.

"Plague infection in rats, wild rodents, and parasites from rodents was reported during 1941 in 8 western States--California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, and Washington. It was found for the first time in North Dakota." The table gives details.

Diseases and Parasites: Plague

Anon. Plague infection in California, Idaho, and Oregon, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(27), July 3, 1942, pp. 1006-1007.

One of a series of reports on plague in the States named and also in Nevada and Montana. Gives scientific names of the rodents but not of the ectoparasites involved. The series is continued in the following numbers: 57(28), July 10, pp. 1041-1042; 57(29), July 17, pp. 1072-1073; 57(30), July 24, pp. 1108-1109; 57(31), July 31, pp. 1145-1146; 57(32), Aug. 7, p. 1189; 57(33), Aug. 14, p. 1231; 57(34), Aug. 21, pp. 1283-1284; 57(35), Aug. 28, p. 1320; 57(36), Sept. 4, pp. 1356-1357; 57(37), Sept. 11, p. 1391.

Diseases and Parasites: Plague

Meyer, K. F. The known and unknown in plague, Amer. Journ. Tropical Medicine (William & Wilkins Co., Baltimore, Md. $1.50 a copy), 22(1), Jan. 1942, pp. 9-36, 1 map, 2 tables.

A thorough review with 70 bibliographical references. Especially full on occurrence and distribution of plague in rodents of the 12 western States. Epizootics and their bacteriology, hosts and vectors (the latter indispensable to spread among rodents), transfer to man and symptoms in men are described. The author treats fully also the arrival of plague on the American continent and its spread, persistence, and perpetuation. In addition, control measures are considered. A "bible" on the American plague situation.

Diseases and Parasites: Plague

Mumford, Edward P. Native rats and the plague in the Pacific, American Scientist (George A. Baitsell, Yale University, New Haven, Conn. 25 cents a copy), 30(3), July 1942, pp. 212-217, 2 figs.

Characteristics and distribution of regional rats likely to carry plague; key to 4 groups prepared by Gerrit S. Miller. Bibliography of 17 titles.

Diseases and Parasites: Plague

Stewart, M. A. Present knowledge of the status of vectors of sylvatic plague in North America, Proc. Sixth Pacific Science Congress (University of California Press, Berkeley, Calif.), 4, 1940, pp. 433-437.

History of knowledge of the occurrence of plague in American rodents; list of forms that have (or appear to have) spontaneous plague; account of flea vectors and modes of infection; references to 8 publications on the subject. Author's summary: "Sylvatic plague has been demonstrated in California, Oregon, Washington, Idaho, Nevada, Utah, and New Mexico in North America, and twenty-one species of rodents have been found which had anatomical lesions or bore infected fleas. Since Diamanus montanus (Baker), Oropsylla idahoensis (Baker), and Orchopeas sexdentatus subsp. are most widely distributed among these twenty-one hosts, it is thought their plague transmission efficiencies should be investigated first. Inasmuch as Echidnophaga gallinacea Westwood and Malaraeus telchinum (Roths.) have been recorded from both domestic rats and wild rodents, their roles as transmitting agents between these two groups should be investigated. Suspicion points more strongly towards M. telchinum because of its less sedentary habits. The customary

autumnal incidence of plague lesions in susceptible wild rodents is to be expected since in many such species it has been demonstrated that the flea indices increase markedly in the fall. Wild rodents apparently maintain a more or less constant flea-population level for each season, and a host freed from its fleas will very quickly reacquire its normal infestation. Rodent poisoning operations do not cause an increased flea index on the surviving animals and consequently the infection quantum is not raised as a consequence of such practices. Wild rodents apparently acquire plague infection by ingesting infected fleas, by rubbing infected fleas, and rarely feces, into skin wounds, by bites of fleas with contaminated proboscides, by the bite of infective, blocked fleas, and by cannibalism. The role of fleas in transmitting plague from wild rodents to humans is not understood. A number of cases of human infection have been traced to bites by captive wild rodents."

Diseases and Parasites: Protozoa, Haemoproteus

Herman, Carlton M., and Ben Glading. The protozoan blood parasite Haemoproteus lophortyx O'Roke in quail at the San Joaquin Experimental Range, California, Calif. Fish & Game (Terminal Id., Calif.), 28(3), July 1942, pp. 150-153, figs. 45-47, 2 tables.

Transmission is by the ectoparasitic fly, Lynchia hirsuta. Infection is greatest in birds of from 4-12 months; incidence by age groups among 503 birds is tabulated; total percentage diseased, 84.5. By months, incidence was greatest (100 percent) in October and November. Bibliography of 6 titles; three by O'Roke are briefly abstracted.

Diseases and Parasites: Protozoa, Plasmodium

Huff, Clay G., et al. Proposals for a uniform terminology of strains of avian malaria, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(3), June 1942, pp. 250-254, 3 tables.

Report of a committee of the American Society of Parasitologists. The tables assign numbers to 13 described (and to undescribed) species; letters to original strains, the wild bird sources of which are indicated; and sub-numerals to the various types of Plasmodium cathemerium. References and descriptions are given for identification of the strains.

Diseases and Parasites: Siphonaptera, Foxella

Augustson, C. F. A new subspecies of Foxella ignota (Baker) from California (Siphonaptera: Dolichopsyllidae), Bul. Southern Calif. Acad. Sci. (Los Angeles County Museum, Exposition Park, Los Angeles. 50 cents a copy), 41(2), May-Aug. 1942, pp. 69-71, 2 figs.

From Thomomys altivallis; description, illustration.

Diseases and Parasites: Trematoda, Eurytrema

Denton, J. Fred. Eurytrema procyonis n. sp. (Trematoda: Dicrocoeliidae), from the raccoon, Procyon lotor, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 9(1), Jan. 1942, pp. 29-30, 1 fig.

Texas. Description, illustration, comparative notes.

Diseases and Parasites: Trematoda, Notocotylinae

Herber, E. C. Life history studies on two trematodes of the subfamily Notocotylinae, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(3), June 1942, pp. 179-196, 2 pls., 1 table.

Accounts of experimentally completed life histories of Quinqueserialis quinqueserialis, a parasite of muskrats and meadow and jumping mice, and of Notocotylus stagnicolae, a parasite of wild ducks and shore birds, which is here described as a new species (Michigan). Discussion of the characters used in differentiation of worms of this subfamily. Bibliography of 19 titles.

Diseases and Parasites: Trematoda, Psilostomum

Price, Emmett W. A new trematode of the family Psilostomatidae from the lesser scaup duck, Marila affinis, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 9(1), Jan. 1942, pp. 30-31, 1 fig.

Psilostomum marilae, Maryland. Description, illustration, comparative notes.

Diseases and Parasites: Tularemia

Morgan, Banner Bill. The seasonal occurrence of tularemia in the North Central States, Human Biology (Johns Hopkins University Press, Baltimore, Md. $2.00 a copy), 13(3), Sept. 1941, pp. 334-349, 8 figs., 1 table.

Tularemia, reported from 46 States and the District of Columbia, is increasing in importance; the human mortality rate is about 5 percent. This article discusses the nature of the causative agent and names insect vectors and animal hosts. Cottontails, jack rabbits, and snowshoe hares are the cause of more than 90 percent of the human cases of tularemia in the United States. Other sources of infection are mentioned. Approximately one percent of rabbits are carriers except in epizootics. Cautions are given as to the handling of potential tularemia-bearing animals. Total and seasonal incidences in various States are recorded in text, table, and graphs. Bibliography of 9 titles.

Diseases and Parasites: Of caribou

Erickson, Arnold B., and P. R. Highby. Parasites of the woodland caribou, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(5), Oct. 1942, p. 423.

Results of autopsies revealing a considerable variety of parasites, scientific names of which are given. Saskatchewan and Minnesota.

Diseases and Parasites: Of grouse, ruffed

Mueller, Justus F. Some parasites newly recorded for the ruffed grouse, Bonasa umbellus, in the United States, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Bureau of Plant Industry Station, Beltsville, Md.), 8(1), Jan. 1941, pp. 14-15.

In 46 birds collected in New York, 3 species of trematodes, 3 of cestodes, and 2 of nematodes were found. These are listed but some qualification of the identifications are given in the text. Certain details as to structure and occurrence also are noted.

Diseases and Parasites: Of muskrat

Errington, Paul L. Observations on a fungus skin disease of Iowa muskrats, Amer. Journ. Veterinary Research (600 S. Michigan Ave., Chicago, Ill. $1.25 a copy), 3(7), April 1942, pp. 195-201, 3 tables.

Author's summary: "During the summers of 1935, 1936, and 1938, thirty-five, or 9.6 per cent, of 364 litters of muskrats handled on, or in the vicinity of, Round Lake, a northwest Iowa marsh, suffered from skin disease attributable chiefly to Trichophyton mentagrophytes. Evidence from other localities, where less intensive studies of young animals were carried on between 1934 and 1940, suggests that the disease may be wide spread, at least within the boundaries of the state. Only young muskrats less than 2 months old appeared visibly affected, infections being invariably fatal to those showing gross manifestations before the age of 2 weeks. Ninety-eight, or 73.1 per cent, of 134 members of infected litters were recorded as contracting the ailment and, of the 98, 90, or 91.8 percent, apparently died. In general, incidence and severity of infection alike rose as the breeding season (mid-April to late August) of the muskrats progressed. The population significance of the disease, however, was conditioned by intercompensatory trends both in reproductive rates of the adults and in loss rates of the young. Not only were some losses of young--from disease as well as from predation and miscellaneous agencies--offset by prolongation of breeding and production of extra litters, but, under given circumstances, losses of young through intraspecific friction had ways of increasing about in proportion to the extent that other types of losses diminished."

Diseases and Parasites: Of pheasants

Beaudette, F. R. Heterakis isolonche Linstow (1906) in a pheasant with remarks on tuberculosis and gapeworms, Journ. Amer. Veterinary Medical Association (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 101(787), Oct. 1942, pp. 274-275, 1 table.

Review of previous records of this nematode, mostly from pheasants; 7 bibliographical references given. It is the cause of nodular or verrucose typhlitis; lesions in the case reported are described. The prevalence of

tuberculosis and gapes in captive pheasants is discussed, and tabulated for thousands of inspections over a ten-year period.

Diseases and Parasites: Of plants useful to wildlife

Pearce, John, and Perley Spaulding. Plant pathology in relation to northeastern forest wildlife cover, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 194-202, 1 pl., 1 table.

Points out the significance of some common diseases of trees and shrubs useful in wildlife management. Fungi and bacteria responsible for most of the infectious diseases of trees in the Northeast. The table lists wildlife food and cover plants and records the causes and types of their diseases. The principal types of damage by disease to wildlife food and cover plants are named and described. Bibliography of 18 titles.

Diseases and Parasites: Of raccoon

Chandler, Asa C. The helminths of raccoons in east Texas, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(4), Aug. 1942, pp. 255-268, 2 pls.

Twelve species of helminths found, 7 of which are described as new. One animal was estimated to contain about 50,000 Pharyngostomoides procyonis, besides parasites of 7 other groups. "Each raccoon harbored from 4 to 8 species of helminths. Pharyngostomoides procyonis was the most abundant parasite, Gnathostoma procyonis the most harmful." Bibliography of 37 titles.

Diseases and Parasites: Of rat, Norway

Forbes, William C. Helminths from the Norway rat in northeastern Ohio, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(5), Oct. 1942, p. 431.

Ohio; 7 species recorded from 50 rats; numbers of specimens, rate of infestation, and multiple infections recorded.

Ecology: Carrying capacity

English, P. F. How much game on your hunting area?, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(6), Sept. 1942, pp. 23, 27, 29.

The article deals mainly with conditions in Pennsylvania where carrying capacity is that indicated by the population density that can be supported in winter. "In estimating the carrying capacity of a game range and in preparing management plans for it, all species of wildlife residents of the range must be considered." An area suitable for carrying a maximum number of one species of animal may be unfavorable for others. "Habitat management is essential to improve the carrying capacity on many areas for many species of game animals." Much remains to be done before we will have an accurate idea of carrying capacity and of what determines it.

Ecology: Census methods

Chitty, Dennis. A relative census method for brown rats (Rattus norvegicus), Nature (Macmillan & Co., Ltd., St. Martin's St., London, W.C. 2, England. 1 shilling a copy), 150, July 11, 1942, p. 59, 1 fig.

The author distinguishes between "token" and "surplus" prebaiting; the former attracts the normal population of the vicinity while the latter brings in additional animals. A brief discussion of census methods and their applicability to rats is given. Author's summary: "A method of relative census for brown rats consists of measuring the feeding capacity of the population. It is simple to carry out, applicable in a wide variety of habitats and involves a minimum of interference with the rats. No other suitable technique is known that does not involve killing the rats. The method should be applicable to other populations which consist of only one species of small mammal." Bibliography of 6 titles.

Ecology: Census methods, birds

Davis, David E. A new census method applied to Cuban birds, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(3), July 1942, pp. 370-376, 4 tables.

The aim was to develop a "method which compares two values: (1), the number of birds estimated in the area and (2), the number x x x actually present." Progress of the study is discussed, the data mathematically treated and tabulated, and conclusions drawn. Author's summary: "The reliability of a sampling census method depends upon two assumptions. I. The area chosen is representative of the whole area. II. The technic of counting does not influence the counting. Even if these two assumptions hold, the estimate may be valueless because of day to day variability, which, however, may be checked by a method suggested in this paper. An arbitrary limit of variability is decided upon, depending upon the available data. If the count for any species has a variability greater than this arbitrary value, the census is discarded. If the variability is less than the limit, then the census value is likely to be close to the true value for the population, provided that there is no systematic error in the enumeration and calculation involved in obtaining the estimate. Using this method, the bird population in two ecologically different areas in Cuba is calculated during a period of seven months. The population in these areas shows trends in relation to climatic change, migration, and breeding. It is suggested that in comparisons, the population per unit volume is a more significant measure of density than the population per unit area." Bibliography of 9 titles.

Ecology: Census methods, bobwhite

Phelps, Chester F. How many bobwhites?, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Richmond. 10 cents a copy), 5(2), Spring-Summer, 1942, pp. 81-85, 1 photo, 1 table.

The merits of the use in sample areas of bird dogs, of questionaries mailed to landowners, and of interviews with farmers are discussed. The

third plan was selected. The methods used are discussed and illustrated. The results are considered to be accurate enough to indicate trends.

Ecology: Populations, bird

Hickey, Margaret B. Audubon Magazine's sixth breeding bird census, Audubon Magazine (1006 Fifth Ave., New York, N. Y. This supplement alone 20 cents a copy), 44(5), Sept.-Oct. 1942, Section 2, pp. 16-32, tables.

Reports on 30 widely scattered tracts of varied types, some of which have been censused for from 3 to 5 years. Contains much valuable information on population densities.

Ecology: Populations, bird

Pitelka, Frank A. High population of breeding birds within an artificial habitat, Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 44(4), July-Aug. 1942, pp. 172-174.

Study of a resort area (Dillon Beach, Calif.) clearly delimited by sharp habitat changes. Result, 90 pairs on 7.5 acres, about 12 pairs to the acre. Figures for other population surveys of man-modified habitats are cited, varying from 10 to 20 birds per acre.

Ecology: Populations, small mammal

Hamilton, W. J., Jr. Winter reduction of small mammal populations and its probable significance, American Naturalist (Science Press, Lancaster, Pa. $1.00 a copy), 76(763), March-April 1942, pp. 216-218.

Catches from traplines in New York woodlands are from 2 to 5 times greater in fall than in the following spring. The cause of the vernal decline is not food as the supply is plentiful, nor predation, as due to the protective cover of snow, losses from that cause are less than at other seasons. The snow insulation also shields the animals from freezing. The probable cause of the population drop through the winter is mortality due to senility, the principal species involved having life spans of from only 12 to 22 months.

Ecology: Range

McGinnies, W. G., K. W. Parker, and G. E. Glendening. Southwestern range ecology, Southwestern Forest and Range Expt. Station (Tucson, Ariz.), 211 pp., 12 figs., tables (mimeographed), 1941.

This text prepared especially for use of Forest Service personnel in Region Three contains 10 chapters, a few pages (74-77), one of which is devoted to relationships between animals and plants. Bibliography of 8 pages additional to those above cited.

Ecology: Stripmined area

Yeager, Lee E. Coal-stripped land as a mammal habitat, with special reference to fur animals, Amer. Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(3), May 1942, pp. 613-635, 8 figs., 1 table.

This habitat, which comprises probably not more than 200,000 acres chiefly in midwestern States, and ecological succession upon it are described. Special accounts are given of each species of mammal and of the fur production. The catch for 6 areas in Illinois is tabulated for varying periods of years, as is also that of strip-mined areas compared to others in a single county. "The sanctuary value of the stripmine habitat for wildlife appears to be considerable. Wildlife, with emphasis on fish and mammals, seems destined to play an important part in the management of stripped lands." Bibliography of 14 titles.

Ecology: Vegetation surveys

Lincoln, Ellison. A comparison of methods of quadratting short-grass vegetation, Journ. Agr. Research (Supt. of Documents, Washington, D. C. 5 cents a copy), 64(10), May 15, 1942, pp. 595-614, 4 figs., 10 tables.

Review of literature, of which 15 titles are cited. Description of the methods tested, selection of quadrats, instruction of observers, number and nature of trials made, and of the experimental results. From author's summary: "Three methods of quadratting short-grass vegetation--the pantograph-chart, density-list, and point-analysis methods (referred to as 'chart,' 'list,' and 'point')--were tested on three typical short-grass quadrats, of low, intermediate, and high density. Five trained observers used each method four times on each quadrat, except that the point method was used six times at two different intensities. A 2-week period was required for the comparison, during which, it was concluded, no appreciable changes in the vegetation took place. On an average, the methods reflected the marked differences in grass area between quadrats similarly, although with differing absolute values. x x x In view of the results of this comparison, it is suggested that for estimating area of short-grass vegetation on intensively studied, permanent quadrats which are intended to sample the effects of grazing treatments, the density-list method, carefully standardized, be applied. The point-analysis method, pending its further development, may well be used for training and standardizing observers in the density-list method. The pantograph-chart method should be reserved for those studies in which the greatest need is a detailed graphic record of the vegetation."

Ecology: Winter den

Allen, Durward L., and Marron J. Shapton. An ecological study of winter dens, with special reference to the eastern skunk, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(1), Jan. 1942, pp. 60-68, 3 figs., 2 tables.

Taking advantage of assistance available through the N.Y.A., excavation of occupied winter dens was undertaken. The findings are tabulated,

described in text, and summarized. Authors' summary: "A series of 36 ground dens were excavated and studied in Clinton County, Michigan, in January and February, 1940. Most of these burrows were dug by woodchucks, some with subsequent modification by other species. The average maximum depth was 39.4 inches and the deepest den reached 8 feet 6 inches below the surface. The longest den had a total tunnel footage of 56 feet 4 inches and had 5 openings. The maximum number of nests found in one burrow was 3. No woodchucks were found in the burrows, possibly due to the abandonment of burrows in open situations for woodlot hibernating sites, and the plugging of passages where the animals were spending the winter. One live rabbit was found and a dead one evidently killed by a weasel. No opossums were found, although they were numerous in the vicinity and their tracks show that they use ground dens. Five of the dens contained live skunks with males and females in the ratios 1:1, 1:2, 1:0, 1:1, and 0:1 respectively. The animals handled in burrows and in box traps provide a basis for a population estimate of two per hundred acres. Two of the burrows contained dead skunks entire and in two others fragmentary remains were found. Evidence from the dens, box trapping and dead skunks found above ground indicates that many skunks were dying off at the time of the study. This situation was apparently correlated with a widespread decline of this species in the state. Incomplete evidence from pathology reports indicates that three skunks autopsied were infected with an unknown virus." Bibliography of 14 titles.

Ecology: Of armadillo

Taber, F. Wallace. The value of armadillos to fur animals, Texas Agr. Expt. Sta. (College Station) Progress Report 723, 3 pp., 1 map, Jan. 1941 (mimeographed).

Armadillos are good diggers and average 5 dens in use by each animal. Abandoned burrows are useful retreats for opossums, skunks, and cottontails. Notes on food habits also are given.

Ecology: Of cottontail

Haugen, Arnold O. Home range of the cottontail rabbit, Ecology, (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(3), July 1942, pp. 354-367, 5 figs., 9 tables.

Author's summary: "As determined by live-trapping and marking, adult females occupied an average home range of 14.0 acres during the winter, and an average home range of 22.5 acres during the breeding season. No average size home range has been determined for adult males because the area ranged over by males increased in size with each additional capture. Adult males evidently roam over a large area, perhaps a hundred acres or more. Both sexes of juvenile rabbits appear to have approximately similar range requirements during the fall, between 13 and 15 acres. Breeding female cottontails occupy home ranges which are rarely trespassed upon by other breeding females. In cases where the home ranges of adult breeding females overlap, the overlap usually occurs at only a single trap station, indicating the possibility that the areas defended as a territory may be bordered by strips of neutral ground. The ranges of males may overlap the ranges of females, or other males, indiscriminately." Bibliography of 13 titles.

Ecology: Of Neotoma and Peromyscus

Dice, Lee R. Ecological distribution of Peromyscus and Neotoma in parts of southern New Mexico, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(2), April 1942, pp. 199-208, 1 fig., 1 table.

Author's summary: "Six species of Peromyscus and three species of Neotoma live in southern Mexico. As many as four species of Peromyscus and two of Neotoma may live together as members of the same ecologic association. The two closely related species Peromyscus nasutus and P. truei sometimes occupy the same habitats and may be taken in the same line of traps. Some kind of barrier other than an ecological one must therefore be responsible for their failure to interbreed in nature." Bibliography of 13 titles.

Ecology: Of opossum

Lay, Daniel W. Ecology of the opossum in eastern Texas, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(2), May 1942, pp. 147-159, 3 figs., 3 tables.

The author describes the study area and gives life history details at some length. From his summary the following principal conclusions are cited: "Separate individual territories are not important to opossums as home ranges overlapped in every instance"; sex ratio 57:43; population one to four acres; two litters a year normal; the mean of 65 litters was 6.8 young; the animals are practically omnivorous; "The Texas opossum crop exceeds one million pelts a year, but in value the opossum is probably second to the muskrat"; "No intensive habitat improvement for the opossum can be justified economically."

Ecology: Of pheasant

Eklund, Carl R. Ecological and mortality factors affecting the nesting of the Chinese pheasant in the Willamette Valley, Oregon, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 225-230, 4 tables.

Author's conclusions: "(1) For nesting of the Chinese pheasant in the Willamette Valley, cultivated fields of hay, grain, wild grasses, brush and weeds provided the most favored habitats in the order indicated. Timber and extensive wood lots were of minor value; (2) mowing was the greatest single cause of nest mortality, but more nests were abandoned or destroyed outside of the hay fields, as a result of a combination of other factors. Normal agricultural operations other than grass or grain cutting were not major limiting factors in pheasant nesting; (3) heavy populations of skunks caused considerable nest destruction; there probably should be some control of this species on small-game management areas. Other predators did not cause sufficient nest mortality to warrant their control; (4) rainfall was probably one of the greatest factors in mortality to pheasant chicks, but it is doubtful whether it caused nest abandonment, except in case of flooding; (5) shade was not a limiting factor. Partial shade prevailed at most nests, probably being incidental to the types of cover; (6) type of soil was a basic factor in nest distribution in that it controlled vegetative growth; (7) no preference was shown between

hilly or level ground; (8) drinking water was not a limiting factor in nest distribution, and the same may be said of graveled roads." Bibliography of 7 titles.

Ecology: Of pocket gopher

Buechner, Helmut K. Interrelationships between the pocket gopher and land use, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor, $1.00 a copy), 23(3), Aug. 1942, pp. 346-348.

Geomys breviceps brazensis, near College Station, Texas. On land left idle for several years, few pocket gophers were to be found and they had no appreciably destructive effect upon the vegetation. On a moderately overgrazed area, the number of mounds was nearly 20 times greater. "This may be of economic importance to the land owner in that pocket gopher populations of the magnitude found on the overgrazed area may significantly decrease the carrying capacity."

Ecology: Of pocket gopher

Larrison, Earl J. Pocket gopher and ecological succession in the Wenas region of Washington, The Murrelet (Martha R. Flahaut, Museum Bldg., University of Washington, Seattle. 50 cents a copy), 23(2), May-Aug. 1942, pp. 34-41, 4 figs.

On a rocky flat, presumably reached mainly by snow-tunneling, pocket gophers penetrated the difficult surface layer at the more favorable spots and brought up soil which in time formed mounds. These were added to by soil from radiating burrows. They offer excellent opportunity for the growth in turn of herbs, shrubs, and yellow pine. The mounds join to form more extensive areas of fertile soil. They have been of vital importance in the foresting of the region and in modifying it so that it could be occupied by animals.

Ecology: Of quail, valley

Howard, Walter E., and John T. Emlen, Jr. Intercovey social relationships in the valley quail, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(3), Sept. 1942, pp. 162-170, 1 fig., 1 table.

Authors' summary: "A series of experiments designed to test the social relationships between members of different coveys of Valley Quail at Davis, California confirm earlier observations that social barriers of non-recognition and active exclusion discourage inter-covey mixing. It was further noted in the experimental coveys that strangers were attacked only by birds of their own sex (observations between January and April), that active exclusion gradually subsided with continuous association, that unacquainted birds did not mingle freely even in the absence of active exclusion, and that partially established members of a covey dominated aliens of subsequent introductions. It is suggested that the dominance of aliens by established residents is in large degree related to a favorable psychological attitude gained through familiarity with the physical features of the covey range. Aliens acquire the 'con-

fidence' fundamental to social recognition only after a period of residence on the range." Bibliography of 21 titles.

Ecology: Of range rodents

Horn, E. E., and H. S. Fitch. Interrelations of rodents and other wildlife on the range. In C. B. Hutchinson and E. I. Kotok, The San Joaquin Experimental Range, Univ. of California (Berkeley) Bul. 663, April 1942, pp. 96-129, Figs. 16-18, tables 16-22.

The life zones, position, and climatic characteristics of the range are discussed and the terrestrial vertebrates listed. "The four species which have the most important effect on the forage are the ground squirrel, pocket gopher, kangaroo rat, and cottontail." The appearance, habitat, habits, and relation to the range of each of these forms is discussed in detail; information about the less important species is briefly summarized. Food habits receive most attention. Factors influencing rodent and rabbit abundance are treated, details being given as to the prey of the coyote, red-tailed hawk, and horned owl. The effect of rodents on vegetation in enclosures is described in text, tables, and graphs. This is a progress report, is not summarized, and presents no definite conclusions.

Ecology: Of woodland birds

Johnston, Verna R. Factors influencing local movements of woodland birds in winter, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(3), Sept. 1942, pp. 192-198, 2 figs., 1 table.

Author's summary: "A second-growth forest along the Sangamon River in central Illinois consisted of forty-six acres of four chief habitats--(A) a low moist floodplain (B) a high river bluff (C) an open upland forest and (D) a forest-edge. Trips were made to this area once or twice per week during the winters of 1939-40 and 1940-41. On each trip the distribution of the birds was carefully mapped and notes were taken on their activities. The average winter population during the two winters was 1.4 birds per acre, and included ten and eleven species respectively. A strong wind caused birds to seek sheltered areas and changes in the direction of the wind brought about day-by-day movements from one part of the area to another. A slight wind had little or no effect. Low temperature caused birds to feed almost constantly and to sing little, whereas a rise in temperature decreased feeding and increased singing. Black-capped Chickadees, Tufted Titmice, Downy Woodpeckers, and White-breasted Nuthatches showed a tendency to form flocks at temperatures below 25° and to scatter when the temperature rose above 25°. As far as could be determined, sun and precipitation had no effect on the winter activity of birds in this study."

Economics: Fur, Iowa

Berry, Ree M. Trapping--thrill of boyhood, is almost a million dollar business, Iowa Conservationist (Iowa State Conservation Commission, Des Moines), 1(9), Oct. 1942, pp. 1-3, 3 photos.

Approximately 25,000 trappers in Iowa received last year an aggregate of $903,874 or an average of $36 each. The catch is analyzed by species (muskrat and skunk led) and notes on the habits of the animals and hints on trapping them are given. Suggestions are made also as to the preparation and shipment of pelts.

Economics: Fur, North Carolina

Rabb, Joe C. $1,240,000 fur crop in North Carolina 1940-1941, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 6(4), April 1942, pp. 3-4, 12-13, 2 photos.

Estimate based on dealers' reports; the proportions of the fur yield in relation to human population density, and gross ecological factors are given for 4 districts of the State. For the Commonwealth, as a whole, the percentage of the number of fur animals of the leading species taken was: muskrat, 36; raccoon, 24; opossum, 23; and mink, 8.

Economics: Fur, Ohio

Benjamin, Joel R. The 1941 fur crop in Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 168, 9 pp., figs., tables (mimeographed), Dec. 1941.

The muskrat, raccoon, mink, and skunk in that order are the chief revenue producers. Number of skins handled in the years 1939-1941, inclusive, are tabulated by species; total for the last year 1,172,909; value $1,695,825.

Education: Bird conservation

Calhoun, W. T. Wisconsin wildlife--Birds, Wisconsin Conservation Bul. (Wildlife Conservation Dept., Madison), Pt. 1, 7(4), April 1942, pp. 32-42, illus.; Pt. 2, 7(5), May 1942, pp. 34-

Reports on the value of birds in their consumption of insects and weed seeds. Lists migratory and non-migratory species found in the State. Conditions affecting bird populations are described and some of their natural enemies are named. Needs and progress in protection are outlined. Accomplishments in propagation, restocking, and management including restoration of marsh areas and winter feeding are discussed. The responsibilities of the citizen in conserving bird life are stated and suggestions made for carrying them out. The material was prepared for use in schools; there is a 2-page bibliography of supplementary reading and a number of references to visual aids.

Education: Bird study

Clarke, Talbott E. Bird study in the public schools, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Richmond. 10 cents a copy), 5(2), Spring-Summer 1942, pp. 60-65, 5 photos.

Study skins sealed in glass tubes were used by 65,000 students the first year they were available. Standing mounts were then set up in cases

that could be shipped. Push-buttons under labels yielded a return buzz (powered by a 1-1/2 volt dry battery) for correct identifications. "In one town of about 5,000 population, three units received about 24,000 hours of student use during one month." The work is in some places extended to include bird-walks. Fourth and fifth grade pupils are often able to identify at sight as many as 50 birds.

Education: In 4-H clubs

Holman, Ross L. Youth, trees and game, American Forests (919 Seventeenth St., N. W., Washington, D. C. 50 cents a copy), 48(6), June 1942, pp. 268-270, 285, illus.

Practical accomplishments of 4-H club members in forestry and wildlife conservation. Examples cited from several States.

Education: Future farmers of America

Schwall, Eugene E. Wildlife management on the farm, Ohio Division of Conservation (obtainable from District Office No. 4, 917 Beatty Ave., Cambridge, Ohio), 16 pp., cartoons (mimeographed), 1942.

Brief suggestions as to planting a hedgerow, field border or corner, gully, woodland border, constructing and planting a pond, preparing a food patch, building a feeding station, and making a flushing bar. Brief lists are given of plants useful to wildlife for mast, fruit, browse, herbage, seed, and cover. Chiefly compiled from U. S. Department of Agriculture publications which are cited. Primarily designed for Future Farmers of America.

Food Habits: Birds vs. beet leafhopper

Knowlton, George F. Utah bird predators of the beet leafhopper, Utah Agr. Expt. Sta. (Logan), Mimeograph Series 282, 2 pp., Oct. 1942.

Abstract of previous publications on the subject, and tabulation showing the numbers of beet leafhoppers found in a total of 1,782 bird stomachs. Thirty-four species are represented and of these, the western chipping sparrow, barn swallow, and desert horned lark had eaten largest numbers of the hoppers. "Birds collected in desert breeding areas of the beet leafhopper most frequently contained E. tenellus. Numbers present in stomachs usually averaged higher in areas of high beet leafhopper population; were rare where this leafhopper was scarce. While reducing leafhopper populations throughout the year to a limited extent, the chief benefit of these birds appears to occur through their reduction of fall beet leafhopper populations in permanent and perennial breeding areas."

Food Habits: Birds vs. corn earworms

Barber, Geo. W. Control of earworms in corn by birds, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 35(4), Aug. 1942, pp. 511-513, 2 tables.

Observations in a field of about 5 acres in Chatham County, Ga. Infestation of ears was at the rate of 96.1 percent. Of the larvae found in the ears, 65 percent were Heliothis armigera and 35 percent Laphygma frugiperda. Birds, mainly hairy woodpeckers, "had attacked 712 of a thousand ears examined, usually having drilled through the husks to reach the larvae. x x x in 345 of 1,000 ears kernel injury had probably been prevented by birds." Nearby woodland furnished nesting sites for the woodpeckers. Other birds searched over the corn plants and may have been able to take earworms from the tips of the ears. They probably also took migrating Laphygma larvae.

Food Habits: Cactus seed distribution by small mammals

Cook, C. W. Insects and weather as they influence growth of cactus on the central great plains, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(2), April 1942, pp. 209-214, 6 figs.

Cactus seeds are distributed by water and rodents, but especially by rabbits. "The rodents for the most part aid in scattering the seeds by storing them in small piles near their habitations; the larger rodents, such as pack rats and prairie dogs, eat the seeds and pass them off in their feces. Mice and ground squirrels also aid in seed dispersal, but they as a group are much less important. In the fall, when rabbits resort to cactus fruits for food and water, their skats contain numerous cactus seeds. Rabbits are very plentiful and skats are well distributed. It was found that 35 per cent of the skats contained seeds," averaging 4 each. Germination ranged from 16 to 25 percent, the rate not being changed by passage through the animals.

Food Habits: Destruction of pitch pine seeds

Bramble, Wm. C., and Maurice H. Goddard. Effect of animal coaction and seedbed condition on regeneration of pitch pine in the barrens of central Pennsylvania, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(3), July 1942, pp. 330-335, 4 figs., 1 table.

From authors' summary: "A study of the effect of animal coaction and seedbed condition on germination of seeds and early survival of seedlings of pitch pine has been made by means of seedspots in three typical plant communities of the scrub oak Barrens of central Pennsylvania. In the aspen and scrub oak communities, destructive animal coaction added to unfavorable natural seedbeds prevented establishment of pitch pine from seeds. In the grass community, unfavorable seedbed conditions were sufficient to cause failure of pitch pine to become established. So far as was observed, white-tailed deer had no significant effect on the early survival of seedlings, the animal destruction being caused by small mammals and birds which could reach the seedspots fenced against deer, but could not reach the caged seedspots."

Food Habits: Insect control by birds

Dawson, Ralph W. Insect control by birds, The Flicker (A. B. Erickson, University of Minnesota, Minneapolis), 14(1), March 1942, pp. 1-5, 1 fig.

From a state of neglect and persecution, birds through the efforts of able publicists, were raised to one of esteem and protection in a single generation. The accompanying estimate of the usefulness of birds was high, and as this writer thinks too high, although none of the excerpts he quotes claim general control of insect outbreaks by birds--the conception which he controverts. The paper is self-styled "a critique of established opinion" but so far as evidence in the article goes, it is an attack upon a concept rather than a reality. The essentially sedentary nature of birds when not in actual migration leads him to deprecate the idea that birds flock to the scene of insect outbreaks. However, they do this to some extent. He says that big counts of insects in bird stomachs are no proof of the value of birds in suppressing irruptions of insects, but there is plenty of direct evidence that birds do eliminate insect overpopulations locally. (See Smithsonian Report 1920 (1922), pp. 411-438; and Wildlife Leaflet BS-162, 1940, 6 pp.) Parasites can, but birds can not, reduce a cutworm population, the author avers. But parasites are never at the height of their abundance over the entire range of their host so their benefits are local also. (For a discussion of the comparative merits of birds and parasites, see Scientific Monthly, 27, 1928, pp. 77-80; and of weather and parasites, The Wilson Bulletin, 43(1), March 1931, pp. 28-29). Dawson points out that birds may be definitely injurious by eating harmful insects through consequent destruction of their parasites. So they may be but so also are insecticides, our main reliance for the degree of control of insects necessary to the successful commercial production of crops. The author whom Dawson quotes about bird destruction of parasites, says, "Without the birds, the parasites would not maintain a control x x x and the converse is true." (Tothill, John D., Dominion Dept. Agr. Bul. 3, n.s., 1922) "Balance, equilibrium, is what we want," concludes Dawson, "In maintaining this equilibrium birds do a marvelous service. But when rendering this service, their stomachs are not full of specific, injurious insect pests, but rather moderately provided with a highly varied contents. It has been a difficult task to explain this to the public and even to the specialists, until recently." Nevertheless it should not be forgotten that in the Yearbook of the U. S. Department of Agriculture for 1908 (p. 347) Professor Beal, greatest of American economic ornithologists, whose opinions were generally shared by his colleagues, said on this point: "it would appear that the true function of insectivorous birds is not so much to destroy this or that insect pest as it is to lessen the numbers of the insect tribe as a whole--to reduce to a lower level the great flood tide of insect life."

Food Habits: Rabbits, Jack, distributing cactus seeds

Timmons, F. L. The dissemination of prickly pear seed by jack rabbits, Journ. Amer. Soc. Agronomy (Geneva, N. Y. 60 cents a copy), 34(6), June 1942, pp. 513-520, 2 figs., 2 tables.

This paper records the results of field observations, examination of droppings, and seed germination tests. Author's summary: "The occurrence of prickly pear seeds in the droppings of jack rabbits that had fed upon the ripened fruits was determined from collections made in and near a cactus infested pasture at Hays, Kans. The droppings collected in the pasture contained an average of about 2.5 seeds per pellet, while those collected in nearby uninfested fields only occasionally contained seeds. The germination of the seeds found in the jack rabbit droppings was about 50% greater than that of

seeds taken from dried fruits at the same time. Jack rabbits evidently are important agents in the dissemination of viable prickly pear seed and presumably in the spread of prickly pear plants through western Kansas pastures." Apparently this is another of the evils largely brought on by man, in this instance by fostering heavy grazing, for the author says, "Probably the most practical means of preventing the spread of prickly pear from seed is the proper management of range land to promote the maximum stand and vigor of grass."

Food Habits: Rodent damage to reforestation

Stoeckeler, Joseph H., and Gustaf A. Limstrom. Ecological factors influencing reforestation in northern Wisconsin, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 12(2), April 1942, pp. 191-212, 17 figs., 12 tables.

On experimental plots "birds" and rodents, largely white-footed mice pilfered seed to the extent of from 7.9 to 48.0 percent of 4 species of conifers. "Germination percentages for screened seed spots of red pine were 53 percent at the end of the first year while unscreened spots showed only 5 percent survival." "Biotic factors may rank in equal importance with available soil moisture, soil-surface temperature, and light in determining the success or failure of seeding." Bibliography of 30 titles.

Food Habits: Squirrel damage to conifers

Balch, R. E. A note on squirrel damage to conifers, Forestry Chron. 18(1), 1942, p. 42.

Brief reference is made to the damage to conifers caused by red squirrels cutting off shoot buds from late summer to spring. These squirrels supplement their winter diet of hoarded material with buds of various trees, the flower buds of balsam and fir being preferred in the Maritime Provinces of Canada. (Adapted from Experiment Station Record).

Food Habits: Utilization of Elaeagnus

Davison, Verne E. Use of certain Elaeagnus species, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 59(4), Oct. 1942, pp. 581-583.

Report of field observations and stomach analyses of 9 species of birds feeding upon 3 varieties of Elaeagnus in southeastern States.

Food Habits: Utilization of Ilex

Petrides, George A. Ilex opaca as a late winter food for birds, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 59(4), Oct. 1942, p. 581.

Southeastern Maryland; observations on 5 species of birds.

Food Habits: Wisconsin project

Rossbach, George B. The new Wisconsin food habits research project, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 7(8), Aug. 1942, pp. 23-26, 1 photo, 2 tables.

List of studies to be made under Federal aid legislation; description of facilities; tabulation of foods identified from 12 crops and 2 gizzards of ring-necked pheasants; application of the results of food habits research.

Food Habits: Of bat, pallid

Borell, A. E. Feeding habits of the pallid bat, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, p. 337.

Antrozous pallidus, at Albuquerque, New Mexico. Large grasshoppers, June bugs, and ground beetle. The first were held in the interfemoral membrane while being dismembered and consumed.

Food Habits: Of beaver

Cook, David B. Notes on the summer food habits of the beaver, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(4), July 1942, p. 14, 1 photo.

Seasonal account of observations in Rensselaer County, New York. "Fully half of the summer food is secured from the sward of rice cut grass and associated species, while the remainder is equally divided between the woody plants of the banks and the roots and tubers secured by dredging."

Food Habits: Of birds of Utah

Stanford, J. S., and G. F. Knowlton. Food of some Utah birds, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 59(4), Oct. 1942, pp. 580-581.

Notes on stomach contents of 1 to 3 individuals each of 10 species.

Food Habits: Of bobwhite

Jennings, Dolf. Fall food habits of the bobwhite quail in eastern Kansas, Trans. Kans. Acad. Sci. (Topeka), 44, 1941, pp. 420-426.

Report on study of 126 crops and gizzards from Osage and Riley counties. Both frequency of occurrence and volume are recorded for the plant items identified, and occurrence and total numbers of the animal foods. Leading items are corn, kafir, sunflower, coleoptera, and hemiptera. Chinch bugs were frequently taken. The findings are discussed both alone and comparatively. Bibliography of 5 titles.

Food Habits: Of dove, mourning

Pearson, Allen M., and Lloyd G. Webb. Mourning dove a strict vegetarian, Alabama Conservation (Alabama Conservation Dept., Montgomery. 5 cents a copy), 14(1), July 1942, pp. 3, 12, 3 figs., 1 table.

Report on contents of 163 stomachs collected in Alabama in spring. Seeds and other plant material made up 99, and snails and insects 1, percent of the food. One hundred and thirty-five kinds of seeds were identified, but the important ones were few and were chiefly those of cultivated crops--corn, cowpeas, common lespedeza, sorghum, soybeans, and peanuts. These contributing 46 percent of the diet were mostly taken from wastes. Weed seeds are next in rank. The spiny akenes of cockleburs are swallowed when more desirable foods are scarce. Some damage is done to pine nursery beds and bird-minding is resorted to as a control. The possibilities of improving feeding conditions for doves in spring are discussed.

Food Habits: Of fox, red

Mitchell, Kenneth A. The status of the red fox in west-central Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 163, 29 pp., figures, tables (mimeographed), Aug. 1941.

The comment on fox numbers and depredations is based upon personal questioning of 403 farmers. The average population of the study area (25 townships just west of Columbus) was 1.5 foxes per square mile. Thirty-nine farmers reported losses and 244 no losses during the 12 months preceding the survey; total value estimated at $169.50. Food habits were studied through analyses of 200 scats and 40 stomachs. The leading food items in the scats (in numerical ratio) were plant materials, meadow mice, insects, deer mice, rabbits, and birds (including chickens). In percentage by volume, the mice were far in the lead. In relation to man's interests, the feeding of the red fox is rated as 69 percent beneficial, 27 percent detrimental, and 7.4 percent neutral. The stomachs, collected in winter, contained a high preponderance (72.38 percent by volume) of rabbit remains. Among prey represented about dens, rabbits equalled in number all others combined. The paper is summarized in 24 short paragraphs and is provided with a bibliography of 23 titles.

Food Habits: Of foxes

MacGregor, Arthur E. Late fall and winter food of foxes in central Massachusetts, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 221-224, 5 tables.

During the fall and winter of 1937-1938, 70 stomachs and 164 droppings of foxes were collected in and around Harvard Forest, Petersham, Mass. Both red and gray foxes were represented, the ratio being about 5:1. Most of the gray fox stomachs were empty or nearly so. This study indicates that foxes are not of great importance as predators on game birds in the region. "Foods apparently sought after most by the foxes were cottontail rabbits, apples, and meadow mice."

Food Habits: Of grouse, sage

Knowlton, G. F., and H. F. Thornley. Insect food of the sage grouse, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 35(1), April 1942, p. 107.

Report on the stomach and crop contents of 17 Utah specimens. Mormon cricket eggs were prominent among the orthopterous food; hemiptera, coleoptera, and ants were freely eaten. All material identified is listed.

Food Habits: Of killdeer

Knowlton, George F. Insects in killdeer stomach, Bul. Brooklyn Entomological Soc. (Science Press, Lancaster, Pa. 75 cents a copy), 37(1), p. 23.

A living tabanid (horse-fly) larva issued from the stomach 20 minutes after the death of the bird. The other contents, mostly smaller tabanid, stratiomyid (soldier-fly), midge and caddis fly larvae, are listed. Utah.

Food Habits: Of kite, white-tailed

Bond, R. M. White-tailed kites feeding on house mice, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(5), Sept.-Oct. 1942, pp. 231-232, 1 table.

Report on contents of possibly 50 pellets. Numerically, house mice constituted more than 80 percent of the prey; meadow and harvest mice also were taken.

Food Habits: Of lizards

Knowlton, Geo. F. Range lizards as insect predators, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 35(4), Aug. 1942, p. 602.

Report on the stomach contents of 69 Sceloporus g. graciosus and 3 Phrynosoma d. ornatissimum. In some areas 500 lizards per acre were present. All food items identified are listed under their scientific names.

Food Habits: Of otter

Lagler, Karl F., and Burton T. Ostenson. Early spring food of the otter in Michigan, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 244-254, 3 figs., 3 tables.

The sources of the material and the methods of the study are described. The report is in two sections relating to trout and non-trout waters. Fishes constituted about 50 percent of the food, somewhat exceeding that and including, surprisingly enough, a larger proportion of game and pan fishes in the second category of waters. The other items of importance were crayfishes, amphibians, and insects. Tables record the findings for the two classes of waters and for all of the material combined. The text contains numerous explanatory details.

Food Habits: Of owl, barn

Alcorn, J. R. Food of the barn owl at Soda Lake, Nevada, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(3), May-June 1942, pp. 128-129.

Numerical report on the contents of 89 pellets; pocket gopher, kangaroo rat, and Brewer's blackbird remains predominated.

Food Habits: Of owl, barn

Cowan, I. McT. Food habits of the barn owl in British Columbia, The Murrelet (Martha R. Flahaut, Museum Bldg., University of Washington, Seattle. 50 cents a copy), 23(2), May-Aug. 1942, pp. 48-53, 2 tables.

Report on the animals identified from pellets collected near Crescent Beach. "It is undeniable that the bulk contribution of each prey species to the diet of the predator is of much greater importance than the numerical occurrence." Hence the author adopts a set of equivalents from which the contribution of the items to subsistence are calculated. On that basis 62 percent of the food was derived from Microtus townsendi; 16 percent from Rattus norvegicus; and 11 percent from Microtus sorpens. Author's conclusion: "On the basis of 300 pellets covering one entire year it is obvious that in British Columbia the barn owl confines its predatory activities primarily to small rodents, and particularly to those species responsible for important damage to field crops and other agricultural produce. Accordingly, this owl must be considered to occupy a highly beneficial position in its economic relation to man. It well merits the legal protection afforded it by law but not accorded it by the sportsmen of the Lower Fraser Valley."

Food Habits: Of owl, burrowing

Bond, R. M. Food of the burrowing owl in western Nevada, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(4), July-Aug. 1942, p. 183, 1 table.

Analysis of 12 pellets and tabulation of food items identified. Leading, numerically, were spadefoot toads and beetles.

Food Habits: Of pheasant

McLaughlin, Charles L. Food habits of the ring-necked pheasant in the Connecticut River Valley, Massachusetts, Mass. Dept. of Conservation (Boston), Research Bul. 1, 56 pp., 28 tables, 9 figs. (processed), Aug. 1942.

The methods of the study, including field observations, and analysis of crop and gizzard contents and of droppings, are described. The results are presented seasonally for each of these classes of material and also are summarized. Principal foods are listed as wild seeds, 32.54 percent; grains, 26.26; insects, 19.55; vegetation, 11.62; and fruits, 10.03 percent. Seeds of injurious weeds predominate in their, and corn in its, categories. Insects are eaten most extensively in spring and summer and fruits in winter. An

inventory of food resources indicated that a pheasant population double the actual could be carried through the winter on the supplies available on cultivated lands alone. Experiments with food patch plants showed corn to be the best, yet for corn borer control, all corn must be plowed under by December 1. From a practical standpoint, a mixture of soybean and buckwheat was most satisfactory. Bibliography of 23 titles; a notable omission is the Special Report of the Board of Commissioners of Fisheries and Game, under Chapter 70 of the Resolves of 1913, relative to the habits of those birds commonly known as pheasants, (House No. 2049, 14 pp., Jan. 1914) by George W. Field, George H. Graham, and William C. Adams.

Food Habits: Of pheasant

Merritts, Helen V. Want pheasants? Keep them fed, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(2), May 1942, pp. 9, 30-31, 3 tables.

Report on the contents of 49 November-collected crops; corn the leading food item. Comparison with results of 1938-39; notes on food habits in other States; recommendations. "For both food and cover, fields of standing handpicked corn are the best." Notes on food patches and winter feeding. Bibliography of 11 titles.

Food Habits: Of pocket mouse, Coues'

Smith, Clarence F. The fall food of brushfield pocket mice, Journ. Mammalogy (Ermet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 337-339.

Perognathus parvus mollipilosus. Tabulation, by frequency of occurrence, of foods identified from the cheek pouches of 29 mice collected at the base of Mount Shasta, California. Seeds of Ceanothus velutinus were by far the most important item; 6 others are listed by scientific names. Up to 357 seeds of Ceanothus were found in the cheek pouches of a single mouse.

Food Habits: Of raven, white-necked

Aldous, Shaler E. The white-necked raven in relation to agriculture, U. S. Dept. of the Interior, Research Report 5 (Supt. of Documents, Washington, D. C. 10 cents a copy), 56 pp., 12 figs., 5 tables, 1942.

Author's abstract: "The white-necked raven (Corvus cryptoleucus), a close relative of the common crow, is indigenous to southwestern United States and the adjoining sections of Mexico. Because in parts of its range it has gained the same ill repute as acquired by the crow and magpie in their respective ranges, a 5-year detailed study of its activities and food habits was made, during which many field data were gathered, and the contents of 827 stomachs were analyzed. The omnivorous food habits of this raven often bring it into direct competition with farming interests, and frequently its depredations result in severe damage to crops, particularly to grain sorghums, corn, melons, peanuts, pecans, weak lambs, and poultry. To reduce these attacks and keep the losses at a minimum often is expensive and requires considerable work and ingenuity on the part of farmers and ranchers. On the

other hand nearly half the raven's food is of animal origin and includes a wide assortment of insects, many of which are harmful to crops. Grasshoppers, weevils, May beetles, caterpillars, fly maggots, and like pests constitute a material part of the insect diet. Carrion is another important food of the raven, and its removal from the range is a definite aid to sanitation.

"When heavy raven concentrations occur, the crops must be protected. As effective control is impossible when natural food is abundant, it is generally necessary to resort to frightening measures until winter sets in and the food supply becomes low enough to insure control success. Various contrivances to scare the birds away may be placed in the fields, but the shotgun is without question the best frightening device. The most successful, selective, and humane control measure is the use of large cage traps x x x As the need for control is usually local and varies by seasons, depending upon the crop situation, the soundest policy is to resort to it only when necessary and to take advantage of the bird's better attributes at all other times."

Of the 827 stomachs examined, 120 were those of nestlings. The total volumes of animal and vegetable matter in the diet of the adult were about equal. The nestlings were almost entirely carnivorous. Bibliography of 15 titles.

Food Habits: Of shrew, short-tailed

Ingram, Wm. M. Snail associates of Blarina brevicauda talpoides (Say), Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 255-256.

This species stores living snails as a reserve food supply; kinds used in Albany County, New York, are listed. The article gives a resume of published information on the snail-eating habits of shrews. Bibliography of 11 titles.

Food Habits: Of squirrel, gray

Dambach, Charles A. Gray squirrel feeding on Crataegus, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), August 1942, p. 337.

Removing seeds from the fruit of C. mollis in Ohio.

Food Habits: Of turkey

Dalke, Paul D., W. K. Clark, Jr., and L. J. Korschgen. Food habit trends of the wild turkey in Missouri as determined by dropping analysis, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 237-243, 3 figs., 4 tables.

Authors' summary: "This study of the food habits of the wild turkey is based entirely upon data obtained from the examination of 3,244 droppings collected at random from wildlife refuges in the Ozark Mountains of Missouri from September 1938 to October 1940. Trends in the seasonal food habits are

shown to correspond with availability of the different classes of food. Plant foods comprised approximately 75 per cent of the annual subsistence, grass seeds and blades and acorns being most important. Insect foods made up the remaining 25 per cent of the diet, beetles, grasshoppers, and ants comprising nearly four-fifths of all the animals eaten." Bibliography of 8 titles.

Food Habits: Of turtle, painted

Raney, Edward C., and Ernest A. Lachner. Summer food of Chrysemys picta marginata, in Chautauqua Lake, New York, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh, Pa. 75 cents a copy), 1942(2), July, pp. 83-85, 1 table.

Report on examination of 90 stomachs; in volume the contents were about equally divided between plants and animals. Snails contributed 16, fishes 14, and insects 11, percent of the food. Algae and leaves and stems of waterweed (Anacharis) were the principal vegetable foods. In summary, the author says, "that painted turtles eat a few young game and pan fishes, as well as forage fishes, and also eat such food as insects, snails, and crayfish which may also be eaten by fishes. However, we doubt if they offer serious competition to desirable fish life in Chautauqua Lake, since the type of food taken is probably seldom the limiting factor affecting fish production in weedy situations where these turtles usually are found. They serve a useful purpose as scavengers."

Food Habits: Of weasel, short-tailed

Aldous, Shaler E., and J. Manweiler. The winter food habits of the short-tailed weasel in northern Minnesota, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 250-255, 5 tables.

In 80 stomachs mice formed 54.5 percent and shrews 21.8 percent of the food by volume. Examination of the contents of 60 stomachs and 53 intestines from the same group of weasels gave closely comparable results. One of the tables contrasts the results of food habit studies of the species in New York and Minnesota. Live trapping of 972 small mammals enables the authors to conclude that the principal groups "are eaten in direct ratio to their relative abundance."

Food Habits: Of wren, rock

Knowlton, George F., and F. C. Harmston. Insect food of the rock wren, Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 3(1), June 1942, p. 22.

List of food items, mostly insects, identified from 88 stomachs collected in Utah. No fewer than 59 sugar-beet leafhoppers, 64 false chinch bugs, and 658 ants had been taken by individual birds. "Because of its feeding so extensively upon injurious x x x insects the rock wren should be considered a beneficial and desirable inhabitant of the western range and farm lands."

Introductions

Anon. Should we introduce exotic game birds?, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 6(7), July 1942, pp. 3, 15.

Of the following numbers of the species indicated that were liberated on two Piedmont estates, only a few California quail are known to have lived for any length of time: Mexican quail, 1,800; ring-necked pheasant, 1,700; Hungarian partridge, 40; California quail, 40; Chukar partridge, "hundreds." "Maybe we should be content with improving conditions for game birds which we know have been present on our land since the beginning of agriculture."

Introductions: Exotic game birds

King, Ralph T. Is it wise policy to introduce exotic game birds?, Audubon Magazine (1006 Fifth Ave., New York, N. Y. 35 cents a copy), 44(3), May-June, 1942, pp. 136-145, 2 pls.; 44(4), July-Aug. 1942, pp. 230-236, 2 pls.; 44(5), Sept.-Oct. 1942, pp. 306-310, 1 pl.

The author defines wildlife values as commercial, recreational, biological, social, aesthetic, and scientific, and tests the worth of introductions in these categories. The opinions of authorities are reviewed at length and references given to a total of 19 titles. The paper is full, well organized, and accurately summarized. The author's conclusions are: "(1) Economically the introduction of foreign species has been and undoubtedly will continue to be highly expensive; (2) the number of well intentioned introductions that have resulted in establishment of the introduced species and have since proven to be non-beneficial if not actually injurious is equally as great as the number that have proven to be desirable; (3) introductions resulting in establishment always create heavier demands on both foods and coverts, may involve the introduction of new parasites and diseases, and may result in cross-breeding to the detriment of closely related native stock. Furthermore such introductions do not necessarily result in reducing the hunting pressure on diminished native species; (4) introduction of additional animals into exhausted or deficient environments can only result in loss of the animals and further deterioration of the environments; (5) introduced species can and have increased to pest proportions; (6) we cannot be sure of the population behavior, food habits and degree of spread of any introduced species until several years after the species has become successfully established; (7) any successful introduction must inevitably change natural associations and the native fauna to some extent. We cannot tell to what extent until the introduced species is established; (8) unfortunately we have not taken advantage of our opportunities and as a consequence have learned relatively little about the costs and results of introductions."

Introductions: Musk ox

Young, Stanley P. The return of the musk oxen, American Forests (919 Seventeenth St., Washington, D. C. 35 cents a copy), 47(8), Aug. 1941, pp. 368-372, 9 photos. Reprinted in Congressional Record, 77th Congress, First Session, Aug. 12, 1941.

Thirty-four musk oxen were transported from Greenland to Norway, thence by way of New York and Seattle, to Fairbanks, Alaska, without loss. This was in 1930; by 1939 the herd had increased to 60 on Nunivak Island. The author describes the animal, briefs its life history, and tells of previous attempts to transplant it. This last successful effort is described in detail and illustrated. Musk oxen had not previously been seen by white men in Alaska, but according to native tradition (as well as to fossil remains) formerly occurred there. With good fortune, much of the Territory may be repopulated from the nucleus established on Nunivak.

An article by E. R. Yarham in the September issue of the same journal (pp. 424-425, 448, 1 photo) gives further information on the life history and on the value of these animals and describes "Canada's fight for the musk oxen."

Introductions: Partridge, Chukar

Solyom, Val. The chukar partridge in Tennessee, The Migrant (Alfred Clebsch, 838 Gracey Ave., Clarksville, Tenn.), 11(1), March 1940, pp. 11-12.

Planted in 27 areas; known to have reared young in one.

Life Histories: Alligator

Brimley, H. H. Alligators and crocodiles. 'Gator hunting in North Carolina, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 6(4), April 1942, pp. 8-11, 2 photos, 2 figs.; 6(5), May 1942, pp. 5-8, 14, 1 photo.

Food items in the order of importance in eastern North Carolina include: terrapins, water snakes, water birds, and fishes. Crabs and carrion also are taken, in fact nothing in the flesh line seems to come amiss. Notes are given on growth, length, and weight; feeding habits and bellowing. Distinctions between alligators and crocodiles are described and illustrated.

Life Histories: Beaver

Davis, Joe. Beaver survey reveals many interesting facts, North Dakota Outdoors (State Game and Fish Dept., Bismarck. 5 cents a copy), 5(1), July 1942, pp. 3-9, 23 photos.

An account of the subspecies of North Dakota beavers, their characteristics, and habits. Beaver colonies contain a pair and their offspring of two years; possible maximum 14. One colony may maintain several dams. Most North Dakota beavers live in bank burrows, not lodges. Food plants are listed; the most important is aspen. In parts of the State, trees are precious and beaver damage is accentuated. The animals suffer little from predation, and their parasites appear to be harmless. The beaver harvest for the last five years is tabulated and discussed; total 6,727. The catch can safely be increased.

Life Histories: Bighorn

Honess, Ralph F., and Nedward M. Frost. A Wyoming bighorn-sheep study (Wyoming Game and Fish Dept., Cheyenne), Bul. 1, 126 pp., 46 figs., tables. 1942.

The title page gives authorship as cited but important sections are contributed by other individuals mentioned further on. A comprehensive report on a Federal-Aid project. The natural history of the bighorn is treated under numerous headings, some of which are: appearance, range, habitat, flock size, seasonal migrations, habits, and life history. The food habits section includes a list of food plants based upon field observations and analyses of 8 stomach contents. According to the latter, grasses made up 48.3 percent of the food, browse 19.4, forbs 29.6, and sedges 2.5, percent. Alexander Johnston and Robert H. Burns are authors of a chapter on the fleece, which describes and illustrates both its macro- and micro-scopic characteristics. Following that, the general authors take up the discovery and early distribution of bighorn sheep in Wyoming and trace its decline which was chiefly due to usurpation of the range by domestic animals and to disease, especially scabies. Hunting then became a menace to the greatly reduced herds. Now there are only about 2,500 bighorns left in the State. The herd on Crystal Creek, Teton County, was most intensively studied. Its habitat, distribution, history, and decimation are reported upon by Honess and Frost. Their account contains a special discussion of coyotes as predators, including findings from the analysis of 584 droppings and 24 stomachs. Although mountain sheep remains were distinctly less prevalent than those of deer and elk, they were present at all times of year. The evidence was deemed to justify control of the coyotes on the limited range. Eagles are not considered a menace in this locality. Hunting both legal and illegal should be further restrained. Warren J. Allred provides a special range study of the Crystal Creek area in which competition with livestock, nutritive qualities of the forage, and mineral requirements receive special attention. O. A. Beath, well-known for his studies of selenium poisoning, adds a chapter on the biological significance of mineral licks. Honess and Frost resume with reports on iodine metabolism, feeding and salting experiments, and on parasites and diseases. Summary material on the special study area is as follows:

Summary

"(1) The Crystal Creek flock of bighorn sheep is still being decimated but there are indications that the number of lambs surviving their first summer is increasing; (2) there is intensive competition between deer, elk, and bighorn sheep; (3) there is direct competition between domestic stock and elk and indirect competition between domestic stock and bighorn sheep; (4) under the conditions too many game animals are being wintered on the Gros Ventre River; (5) grazing regulations in the conduct of cattle trailing through elk winter range are not being rigidly enforced; (6) regulations governing the pasturing of horses during the hunting season are not being enforced; (7) forage is of poor quality; (8) both young and adult sheep suffer from a variety of diseases; (9) a sincere cooperative effort to solve the problem of winter range for game on the Gros Ventre River is not being made."

Conclusions

"(1) The basic cause of decimation is insufficient and deficient winter forage; (2) the secondary cause of decimation is a contagious pneumonia among lambs and verminous pneumonia among the adults; (3) predation by coyotes is not a serious cause of loss; (4) predation by eagles was not observed or reported and therefore is not considered as a serious cause of decimation; (5) legal hunting is not a cause of decimation; (6) killing of bighorn sheep by elk or deer hunters who mistake them for other big game animals occurs but is of minor importance; (7) lack of fertility is not an important cause; (8) inbreeding as a factor in decimation could not be determined."

Recommendations

"(1) Feeding on the winter range until range conditions are improved. This was proved feasible; (2) place needed minerals in licks; (3) annihilation of deer on the bighorn sheep winter range; (4) transfer cattle now grazing on the Gros Ventre River to ranges on the Buffalo River, and other streams to the north."

Other ranges are more briefly treated and the paper ends with general recommendations, a list of plants collected in the Gros Ventre River area, and a bibliography of 22 titles. This is the most important work on the bighorn that has yet appeared. If preservation of the animal is the objective, the recommendations made are not drastic enough, especially with respect to hunting. To assure conservation, some other interests must give way to those of the bighorn and positive, and if necessary, ruthless, action should be taken. Without it, protestations that we mean to save the bighorns are words of little weight.

Life Histories: Birds

Bent, Arthur C. Life histories of North American flycatchers, larks, swallows, and their allies, U. S. National Museum, Bul. 179 (Supt. of Documents, Washington, D. C. $1.00 a copy), 555 pp., 70 pls., 1942.

Fourteenth in this valuable series in progress since 1919. The work is cooperative and in addition to contributions of numerous correspondents that are incorporated, 13 of the life histories were prepared by 8 other authors. So far as practicable, the accounts treat courtship, nesting, eggs, young, plumage, food, behavior, voice, field marks, enemies, distribution, and migration. This volume presents life histories of nearctic becards, flycatchers, larks, and swallows.

Life Histories: Buffle-head

Munro, J. A. Studies of waterfowl in British Columbia, Canadian Journal of Research (National Research Council of Canada, Ottawa. 50 cents a copy), D, 20, pp. 133-160, 2 pls., 2 tables, 1942.

Another of this writer's valuable life history studies, giving as usual more attention to food habits than do most such contributions. Author's abstract: "Charitonetta albeola is a common summer visitant to parts of the

interior of British Columbia and is abundant on the coast region in winter. Adults arrive in the interior in advance of the yearlings and the sex ratio in early spring flocks is predominantly male. Later, both age groups associate for a short time, then the paired adults become established on nesting territories. Most of the yearling males, and subsequently the adult males, disappear for six weeks or longer. They eclipse and begin to appear again on certain lakes in August but are not plentiful until late September or early October. The yearling females remain on the breeding grounds in flocks throughout the summer. Courtship which is observed first on the coast in March reaches its greatest intensity on the interior lakes in April. Males vigorously defend their nesting territories. Eggs are laid [in tree cavities] in May and by the last week of June most of the young have appeared. Breeding females leave their broods in order to moult before the young have reached the flying stage and associate with flocks of yearling females that have gathered on certain waters where food is abundant. At this time all are excessively wary. In the interior aquatic insects are the chief food of downy young, adolescents, and adults. On certain lakes amphipods and molluscs are important foods. Fishes, where available, form a minor part of the diet. Seeds of aquatic plants are the main vegetable food except on Okanagan Lake where a larger amount of other plant material is consumed. On salt water, crustaceans and molluscs are first and small fishes, second in importance. The buffle-head is highly regarded as an object of beauty. In the interior it is of economic value as food but is not held in esteem on coast waters. No evidence of it eating commercially valuable fishes was obtained and its consumption of salmon eggs, noted on coast streams, does not reach significant proportions."

Life Histories: Chickadee, Black-capped

Odum, Eugene P. Annual cycle of the black-capped chickadee, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 59(4), Oct. 1942, pp. 499-531, 2 figs., tables.

Third installment (previous in Auk, 58: 314-333, and 518-535, 1941) of a comprehensive study of the life-history of the chickadee by modern methods. This part includes among other matter the account of foods and feeding, the summary, and a bibliography of 30 titles.

Life Histories: Cottontail

Elder, William H., and Lyle K. Sowls. Body weight and sex ratio of cottontail rabbits, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 203-207, 1 fig., 2 tables.

Autopsies were made of 398 rabbits collected from the region about Madison, Wisconsin. Authors' summary: "Female cottontail rabbits average significantly heavier than males. All of our rabbits which weighed over 1,500 grams were females. The heaviest male weighed 1,470 grams. The most typical weight class for rabbits we secured was 1,100-1,200 grams, or about 2-1/2 pounds. Male rabbits lose weight significantly in the late winter and early spring months but females do not. This can perhaps be attributed to the 'holing-up" tendency of the females which may retard weight loss. Juvenile

animals cannot be distinguished from adults by weight alone. Juvenile males can be distinguished from adult males by the turgid appearance of their testes compared to the flaccid state of those of the adults. Adult females have placental sites in their uteri, but juvenile females do not. The age of both sexes can be determined at autopsy in the fall and early winter. The sex ratio of wild cottontail rabbits is probably nearly even. Disparity in published results seems traceable to the methods of capture." Bibliography of 11 titles.

Life Histories: Cottontail

Haugen, Arnold O. Life history studies of the cottontail rabbit in southwestern Michigan, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 28(1), July 1942, pp. 204-244, 20 figs., 8 tables.

This extract from a doctor's thesis describes the study area and the methods of investigation. The life history discussions relate to general behavior, winter food, reproduction, weights, parasites, longevity, mortality, individual ranges, and effect of cover on population density. The longer sections are separately summarized, there is a general discussion and summary, a list of plants of the study area, and a bibliography of 26 titles. From author's summary: "The winter food of the cottontails on the upland areas consists mainly of the bark and twigs of white oak, flowering dogwood, sassafras, black oak, and New Jersey tea in the order listed. As many as four litters in a single season are reared in this region by a single female, and the females apparently breed immediately after parturition. The average number of young per litter during the period of study was 5.4. Weights of cottontails have varied according to sex, pregnancy, age, season, and weather. The average weight during the hunting season is 3 lbs. 3 oz. for the females, 3 lbs. 2 oz. for the males, and about 2.5 lbs. for the immature. The most important enemies of the cottontail in the region are weasels, stray dogs, feral cats, and hawks (red-tail, broad-wing, and marsh). Experiments on the vulnerability of cottontails in an artificial burrow have shown that they are capable of escaping or defending themselves in such quarters. An ecologic relationship between the population density of cottontails and the density of the prevailing ground cover of shrubs has been demonstrated; namely, that rabbits most frequently occupy areas with a generous amount of low ground cover, and may completely avoid locations with a dense forest canopy and no ground cover.

Life Histories: Dolphin, Bottle-nosed

Gunter, Gordon. Contributions to the natural history of the bottlenose dolphin, Tursiops truncatus (Montague), on the Texas coast, with particular reference to food habits, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 267-276, 2 tables.

The species is nearly cosmopolitan and its food has been known, since the time of the ancients, to be chiefly fishes. The author gives notes on miscellaneous observations on speed (about 18 knots p. h.), length (maximum 12 feet), number of teeth, embryos, and calves. The literature on food habits is summarized and the results of 29 stomach analyses tabulated. More than 83

percent of the fishes eaten on the Texas coast were mullets, which are not of commercial importance. "There are indications that the mammal kills or drives sharks away at every opportunity." It should be protected. Bibliography of 17 titles.

Life Histories: English sparrow

Weaver, Richard Lee. Growth and development of English sparrows, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(3), Sept. 1942, pp. 183-191, 3 figs., 1 table.

Part of a doctor's thesis which reported upon a complete life history and bibliographical study of the species. This installment deals with distinctively nestling characters and with the development of the plumage and color pattern. The young spend up to 15, and in some instances 17, days in the nest. Paragraphs from the author's summary are: "Males and females share about equally in the feeding of the young at the nest, but the females do the greater portion of the nest sanitation. Both birds may brood the young, although the female does the greater part of it and always stays in the nest during the night. The young are fed by regurgitation during the first part of the period after hatching. There was 70.5 per cent success of survival in thirty-eight nests which produced 127 young from 180 eggs laid. This corresponds closely to that reported for other hole-nesting species. The older young are able to command the most advantageous positions in the nest and thus receive relatively more food and often are able to leave the nest several days before the other young. The young can fly rather well upon leaving the nest, considerably better than do the young of most species that nest in the open. The young are fed by the adults for a period of two weeks, and probably more, after leaving the nest." Bibliography of 10 titles.

Life Histories: Falcon, Prairie

Williams, Ralph B. Notes on the prairie falcon, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(1), Jan. 1942, pp. 12-15, 1 photo.

All eyries known to the author have been at from 5,000 to 7,000 feet elevation. Behavior in defense of the nest is described. The range is outlined and returns from banded birds recorded. Food as indicated by pellets at 10 nesting sites was mainly ground squirrels; at one eyrie bird remains, principally of pinon jays, predominated.

Life Histories: Fisher

Hall, E. Raymond. Gestation period in the fisher with recommendations for the animal's protection in California, Calif. Fish and Game (Terminal Id., Calif.), 28(3), July 1942, pp. 143-147, Fig. 43, 2 tables.

Record of catch of licensed trappers in California, dwindling from an average of 20 in 1925-27 to 3 in 1938-40. The animal is near extirpation and should be given a closed season of at least three years. The fisher preys to a notable extent upon porcupines. From records of two fur farmers in British Columbia, it is calculated that the mean gestation period is 352 days. Males average 10, females 5-1/2, pounds in weight.

Life Histories: Fox, Red

Lueth, Frances X. Red fox is popular Illinois fur-bearer, Illinois Conservation (Illinois Conservation Dept., Springfield), 7(2), Summer 1942, pp. 13-14, 1 fig.

Notes on economic value, life history, and cycles. This fox not a great factor in reducing the numbers of quail, is a more serious enemy of the pheasant. Aside from hunting for sport, trapping in season is the most desirable form of control.

Life Histories: Grouse, Sage

Scott, John W. Mating behavior of the sage grouse, Auk (J. Fletcher Street, 1102 Locust St., Philadelphia, Pa. $1.00 a copy), 59(4), Oct. 1942, pp. 472-498, pls. 15-17.

Detailed and fully illustrated account of the mating habits, which are polygamous under a graded system of cock dominance.

Life Histories: Hare, Snowshoe

Severaid, Joye H. The snowshoe hare, its life history and artificial propagation, Maine Dept. of Inland Fisheries and Game (Augusta), 95 pp., 43 figs., 14 tables, 1942.

Report on an investigation by the Cooperative Wildlife Research Unit undertaken to find, if possible, a means of counteracting cyclic fluctuations in abundance of the hare. By combining gleanings from the literature (42 titles cited) with his own findings, the writer is able to present the fullest account of the life history of the snowshoe hare that has yet appeared. His propagating studies are the only investigations of this type on a large scale that are known to have been made. The life history deals with distribution of the animal in Maine, general behavior and miscellaneous characteristics, feeding and breeding habits, growth rate, cycles of abundance, pelage changes (these worked out in detail and fully illustrated), and predators, parasites, and diseases. Artificial propagation, the experiments in which are fully described, is practicable and can be done at a cost of $1.25 per animal released. The different sections of the paper are separately summarized.

Life Histories: Mouse, Lemming

Oehler, Charles. Notes on lemming mice at Cincinnati, Ohio, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 341-342.

Synaptomys cooperi stonei. Habitat and life history notes; food was blue grass, moss, other succulent plants, and bark of hackberry roots.

Life Histories: Muskrat

Forbes, Thomas R. The period of gonadal activity in the Maryland muskrat, Science (Lancaster, Pa. 15 cents a copy), 95(2467), April 10, 1942, pp. 382-383.

Spermatogenesis begins in the middle of December, and ovulation in the middle of February; gonadal activity terminates in both sexes during the latter part of October.

Life Histories: Otter, Sea

Fisher, Edna M. The sea otter in California, Proc. Sixth Pacific Science Congress (University of California Press, Berkeley), 4, 1940, pp. 231-240, 11 figs.

The history of the species along the California coast is briefly reviewed. An interesting account of the habits of the animals in present herds, illustrated with drawings by the author, is given. The sea otters mate at all times of year; one or rarely two young are born to each female. The pup can float on its back from birth, but must learn to swim in the reverse posture. Swimming, grooming, feeding, sleeping, and mating are described.

Life Histories: Pheasant

Strode, Don H., and Daniel L. Leedy. Analysis of pheasant reproduction, cover utilization and mortality, Wood County, Ohio--June to October 1, 1940, Ohio Wildlife Research Station (Ohio State University, Columbus), Release No. 167, 34 pp., figs., tables (mimeographed), Sept. 1941.

As cover, grass and weeds led, harboring 27.4 percent of the pheasants seen. Male representation in the sex ratio diminished from 37.6 to 17.3 percent during the season, averaging 28.1. There were certain sexual preferences as to the kind of cover inhabited and the depth to which it was penetrated. Average brood size decreased from 8.8 to 5.8 in the period of study but the percentage of juvenile birds in the population increased from 1.9 to 76.4. Mortality is classified and treated in detail. For every 100 nests observed in hay meadows, 31 killed or crippled pheasants were found. The methods of the study are explained and the forms for recording data reproduced. Bibliography of 14 titles.

Life Histories: Pocket mouse, Sand

Arnold, Lee W. Notes on the life history of the sand pocket mouse, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(3), Aug. 1942, pp. 339-341, 2 tables.

Perognathus penicillatus pricei; south of Tucson, Arizona. About half of all rodents trapped were of this form. The cheek pouch contents of 171 individuals are tabulated; seeds and inflorescences of mesquite and seeds of Zizyphus were the leading items. All parts of mesquite together composed 54.4 percent of the total food.

Life Histories: Prairie chicken

Douglass, Donald W. A prairie chicken booming grounds survey in central Michigan, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(3), Sept. 1942, pp. 171-172, 1 fig.

On 85 booming grounds, about 472 males and 57 females were counted. The number of males on these areas varied from 1 to 31. "Of the 85 sites visited, 32 were on a knoll or hill, the remaining 53 on level ground, of which 11 were low and wet. Seventy-one of the grounds were within a mile or less of cultivated fields, 53 within 1/4 mile, and 25 on cultivated land. The sites were generally open, mostly covered with sparse grass or other herbs; only 24 of the grounds showed woody growth other than sweet fern. Such woody growth consisted chiefly of scattered shrubs or small trees typical of the surrounding country."

Life Histories: Quail, Valley

Storer, T. I., F. P. Cronemiller, E. E. Horn, and Ben Glading. Studies on valley quail. In C. B. Hutchinson and E. I. Kotok, The San Joaquin Experimental Range, Univ. of California (Berkeley), Bul. 663, April 1942, pp. 130-135, tables 23-26.

A progress report, describing methods of the study including those of census. Results of counts for 6 years are tabulated; birds per acre varied from .26 to .59. Other life history topics commented upon are: sex and age ratios, seasonal changes in weight, nesting, enemies, food and water supplies and their utilization, and disease. Nesting success is tabulated; it varied from 17.7 to 24.6 percent. Losses are distributed among the agents causing them, among which the ground squirrel was by far the most important. The results of experimental hunting on an area of 720 acres are given.

Life Histories: Squirrel, Fox

Brown, Louis G. Forecast better squirrel hunting for 1942 season, Illinois Conservation (Illinois Dept. of Conservation, Springfield), 7(2), Summer 1942, pp. 7-8, 2 figs.

Among other information is summarized data on the life history of the fox squirrel.

Life Histories: Swallow, Bank

Stoner, Dayton. Bird study through banding, Scientific Monthly (Science Press, Lancaster, Pa. 50 cents a copy), 55(2), Aug. 1942, pp. 132-138, 8 photos.

Summary of the work of author and wife with bank swallows since 1923. Notes on burrows and burrowing, eggs, growth and body temperature of young, technic of catching and results of banding, length of life (average about 2-3 years). "So far as we are aware no other person has ever captured one of our banded bank swallows." First year birds do not, adults do, as a rule, return to the same colony.

Life Histories: Turkey in Wisconsin

Schorger, A. W. The wild turkey in early Wisconsin, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(3), Sept. 1942, pp. 173-182, 1 fig.

Comment on early popular names of the turkey and their origin and summary of the bird's occurrence in Wisconsin where it ranged from the southern counties northeasterly to Green Bay. The author believes that the turkey as well as the pinnated grouse and bobwhite maintained a hold in Wisconsin in early days only through periodic replenishment from Illinois. When that reservoir was depleted, the turkeys no longer returned. Attempts at reintroduction have failed. Bibliography of 51 titles.

Life Histories: Weasel, Least

Polderboer, Emmett B. Habits of the least weasel (Mustela rixosa) in northeastern Iowa, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(2), May 1942, pp. 145-147.

Species not so rare as formerly believed. The author presents notes upon observations of four specimens and their environment.

Life Histories: Wren, House

Kendeigh, S. Charles. Territorial and mating behavior of the house wren, Illinois Biological Monographs (University of Illinois Press, Urbana. $1.50 a copy), 18(3), 120 pp., 32 figs., 5 tables, 1941.

Report on 19 years of investigation near Cleveland, Ohio, treating spring arrival, establishment, defense, characteristics, and history of territories, reproductive vigor, mating behavior, and history of individual birds. Adults that have previously nested return to territories the same as or adjacent to those occupied the previous year, and birds that have not nested, while scattering to a greater extent, "occur in greatest relative numbers in the vicinity where they were hatched." Territories are established, advertised by singing, and defended by the males. They may contain from 2 to 7 nest sites. "In the establishment of nest-sites, house wrens may destroy the nests, eggs, or young of the same or of different species, or even other adult birds. Although there is considerable individual variation in this aggressive behavior, it tends to be most intense during years when the total house wren population on the area is highest." Territorial boundaries change during the season and from year to year, mostly in response to competition and to changes in population density. In the area studied they varied from 0.25 to 3.6 acres and averaged 1 acre in size. A non-breeding population includes from 28 to 35 percent of the males and from 13 to 20 percent of the females. Polygyny and polyandry both occur, the former more frequently. Remating of the same male and female for a second brood and for a second year took place in about 40 percent of the possible instances. Two-page bibliography. An excellent report on a thorough investigation.

Management: Bobwhite

Hendrickson, George O. Ecology and management of the bob-white x x x (1) Population data. Iowa Conservationist (Iowa State Conservation Commission, Des Moines), 1(9), Oct. 1942, p. 7, 1 table.

Estimates of fall and spring populations on a 7,700-acre study tract each year from 1935 to 1942 are tabulated. The range is great, 90 to 2,316.

The effects of favorable and unfavorable seasons on the numbers of the birds are commented upon. With auspicious environmental conditions and good management, the area should provide a shootable surplus of from 500 to 1,000 birds.

Management: Bobwhite

Stoddard, Herbert L. Cooperative Quail Study Association (Thomasville, Ga.) Ninth and Tenth Annual Reports 1940-1941, 39 pp., 1942.

Besides matter of special interest to members of the Association, the report includes discussions of wider value in the field of wildlife management. Timber improvement cuttings is among them: "The important thing is to leave a properly spaced stand of the best trees for further growth so that the forest will constantly improve from the standpoints of scenic, hunting, and timber values." The effect of grazing on quail lands is thoroughly considered (pp. 9-20). Except in the Kissimmee Prairie region of Florida, year-round livestock grazing is incompatible with satisfactory quail production. The comparative returns from leasing or purchasing quail lands are fully discussed. Leasing at from 2.5 to 20 cents per acre, while formerly satisfactory, has become less so due to fire-exclusion propaganda, an expanding livestock industry, intensification of agriculture, increase in hunting, and in quail enemies and diseases. The cream of quail shooting now goes to those who purchase and develop shooting lands. It is good to have these extended discussions of important problems with which the writer is so familiar. The food habits and control of mammalian predators, and of rodents are discussed. Blackberry patches, while valuable in providing food and cover, may become a handicap to the movements of both dogs and men. Ways of controlling or eradicating them are described. The value and management of alyce clover (Alysocarpus vaginalis) and runner oak (Quercus pumila) are discussed.

Management: Bobwhite

Wilson, Kenneth A., and Ernest A. Vaughn. Quail management in Maryland, Maryland Conservationist (514 Munsey Bldg., Baltimore, Md.), 19(3), Summer 1942, pp. 16-20, 4 tables.

History of project originally established by the Resettlement Administration in 1935, developed by various agencies and finally transferred to the Maryland Department of Forests and Parks and managed by the Game and Inland Fish Commission with the aid of Pittmann-Robertson funds. Comparative notes are given on quail censuses that have been carried on for 7 consecutive years and the results of the latest are presented in text and table. Heaviest quail populations and best hunting have resulted when the land use patterns have approximated the following percents: annual food patches, 20; Lespedeza sericea, clover, and other perennial plantings, 30; and idle land, plowed or disked at least every three years, 50. The authors give positive evidence of the value of L. sericea as a winter quail food. Idle lands are soon taken by broom-sedge; partridge pea was especially successful in holding its own against the Andropogon but has a shattering habit that renders collection of seed difficult. Food habit studies have been continued and the results of examination of 23 crops are presented in tabular form and discussed. Predator control is carried on but not emphasized; examination of scats of gray foxes showed the principal food to be rabbits.

Management: Deer, White-tailed

Feeney, W. S. Famine stalks the deer, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 7(9), Sept. 1942, pp. 8-10, 3 photos.

During summer there is an abundance of deer food in Wisconsin but in winter where yarding is practiced the animals consume local supplies. Inspection of more than 200 deer yard territories showed that two-thirds of them had been excessively over-browsed. "In more than one-third of these yards, a great number of deer starved as a result of browse exhaustion during February and March of 1941." About 80% of the losses were fawns. Harvesting each year's surplus would eliminate much of the winter losses and also improve browse conditions for the remaining deer.

Management: Deer, White-tailed

Gordon, Seth. Pennsylvania bags 700,000 deer in ten years, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(4), July 1942, pp. 3, 26-27, 29, 5 photos, 1 table.

Fluctuations in number of the animals and causes that contributed to them are discussed; changes in specifications of open seasons that were made to control the herd are described and the legal kill, 1915-1940, is tabulated.

Management: Deer, White-tailed

Morse, Marius, and Paul Highby. The status of Minnesota deer, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 4(20), May 1942, pp. 13-16, 1 table; 4(2), June 1942, pp. 58-64, 3 figs.

From November 1938 to November 1939, the average number of animals on a square mile in the hunting range rose from 12.7 to 14.6 and dropped to 13.9. The causative factors, natural and human, are appraised and discussed. Deer hunters' reports are analyzed and hunter success is calculated. The population is fluctuating, being subject to declines of as much as 25 percent. It should be maintained in balance with winter food. Legal hunting is not keeping deer numbers to the desired level but it should be increased until it does have the desired effect. Artificial feeding is not recommended.

Management: Deer, White-tailed

Wilson, Kenneth A., and Ernest A. Vaughn. The Worcester County deer herd, Maryland Conservationist (514 Munsey Bldg., Baltimore, Md.), 19(3), Summer 1942, pp. 6-8.

Two doe and one buck white-tailed deer were released in an evergreen forest in Dorchester County, Md., in 1926; since then the number of animals has steadily increased and in 1941 a total of 52 deer were bagged. While some damage has been done to farm crops such as cowpeas, melon vines, white potato vines, soybeans, and fruit tree nursery stock, not many complaints have been received, as the farmers seem to take pride in the herd. Examination of the stomach contents of a shot deer revealed acorns, persimmon fruits, and browse

from Japanese honeysuckle, sweet gum, red maple, wax-myrtle, bayberry, and red-cedar. In an area of about 100,000 acres, characterized by large contiguous stands of loblolly pine and mixed hardwood-evergreen forests, interspersed by farmland, it is believed that at least 1,000 deer wintered last year. This estimate is made on the basis of track counts on sample plots; applicability of this and other census methods is discussed. Recommendations are made for management of this herd.

Management: Dens for fur animals

Polderboer, Emmett B. Artificial aids in producing a farm fur crop, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 208-209, 2 figs.

Author's summary: "(1) The seepage areas, hanging bogs, and waste lands on northeastern Iowa farms often lack good den sites and protection from dogs when other conditions are favorable for resident fur animals; (2) old road culverts, tiles, and milk cans may be used to make artificial dens. When well located and protected from molestation by dogs and trampling by livestock, these encourage residence of fur bearers, notably skunks and minks, during all seasons of the year; (3) the value of furs taken on the average section of Iowa farm land where artificial dens were located increased as much as $5.00 a year over that of previous years; (4) large junk piles placed in gullies helped to check erosion and provided refuges utilized by valuable fur bearers and cottontail rabbits."

Management: Elk

Olsen, Orange. Managing Nebo's wapiti, U.S. Forest Service (Washington, D. C.), 4 pp. (mimeographed), 1942.

Elk, reintroduced into this Utah mountain range, in 1914, increased under protection and coddling until they seriously damaged fences, haystacks, orchards, and crops. Payment of damages was not satisfactory as the trouble continued. Sportsmen long opposed regulation of the numbers of the herd, but finally an agreement was reached to hold it to between 500 and 600 head. Hunting to maintain this number is under special permit and is concentrated where most needed. In 27 years since introduction, 1,934 animals have been removed, 1,755 by sportsmen. This is in addition to those killed to protect crops and those lost through natural causes and poaching.

Management: Farm wildlife

Semple, A. T., and M. A. Hein. Pastures to hold and enrich the soil, U. S. Dept. of Agriculture Farmers' Bul. 1900 (Supt. of Documents, Washington, D. C. 10 cents a copy), 29 pp., 23 figs., 3 tables, 1942.

On page 8, wildlife utilization is mentioned as a function for lands not suitable for ordinary crop, pasture, or woodland use; and on page 9 the draining of small areas of marsh is termed uneconomic and the suggestion is made that they can be rendered productive of muskrat pelts.

Management: Farmer-sportsman relationship

Swanson, Gustav. The farmer and the sportsman, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 5(26), Nov. 1942, pp. 1-4, 1 cartoon.

An attempt to impress sportsmen with their great obligations to farmers for the production and care of game and granting of hunting privileges, with several suggestions as to ways in which some recompense can be made.

Management: Food patches

Anon. Plant food patches for turkeys, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Richmond. 10 cents a copy), 5(2), Spring-Summer 1942, pp. 79-80, 1 photo.

Directions for planting and fertilizing: Brabham cowpeas, Laredo soybeans, buckwheat, Tennessee German millet, chufas, and winter wheat. Food patches are not only of direct value to the birds but in reducing tendency to drift are useful in turkey management.

Management: Forest management in relation to wildlife management

Hosley, N. W., Chairman. The effects of forest harvest on game production, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 40(8), Aug. 1942, pp. 639-641.

Report by a Committee of 6, incorporating material contributed by 21 individuals, both groups representative of diverse regions and interests. Forest ecology is constantly changing in relation to wildlife, and forestry operations may have profound and far-reaching effects upon the fauna. To evaluate these accurately and to do things of significant benefit to wildlife requires increased knowledge. "We must decide for a given game species in a region what food plants are needed and in what quantities, and permanent sample plots must be laid out and followed through to determine the effects of different cutting methods and their variations." Problems of forest management in relation to wildlife in many parts of the country are briefly described.

Management: Harvest

LeCompte, E. Lee. Analysis of game kill statistics for season of 1941, Maryland Conservationist (514 Munsey Bldg., Baltimore, Md.), 19(3), Summer 1942, pp. 4-5.

Grand total 767,587 head, estimated to have yielded nearly a million pounds of food ready for cooking. Leading groups: rabbits, squirrels, bobwhites. A kill of 676 chukar partridges is reported.

Management: Harvest, big game, Wyoming

Anon. 1941 big game kill sets record, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(3), March 1942, pp. 11-18, 5 photos, tables.

Detailed tabulation for the year and summaries for 7 years (1935-41); last and highest, 18,614. The estimated weight and value of the meat are some three million pounds and roundly $458,000. Overpopulations, range conditions, hunter success ratios, and age classes of the deer and elk killed are discussed.

Management: Harvest, buffalo

Gambrell, Roy. Arizona buffalo hunt, 1942, Arizona Wildlife and Sportsman (Flagstaff. 15 cents a copy), 4(6), May 1942, pp. 8-10, 1 photo.

Thirty-four of a herd of 233 animals were killed under permits. The conditions and results of the hunt are described. Bang's disease is apparently not present in the herd. Individual animal weights were below estimates, the heaviest being 635 pounds. Records are needed to determine herd weights or approximate ages. Unless overcome, difficulty of field determination of age and sex classes may well interfere with efficient management.--Fred Gibson.

Management: Harvest, javelina

Knipe, Theodore. Statistical report of the 1942 javelina hunt, Arizona Wildlife and Sportsman (Flagstaff. 15 cents a copy), 4(6), May 1942, p. 14.

Notes obtained from 77 individuals are given on sex ratios, sizes, and weights; data on caliber of guns used and time and distance traveled per hunter per animal are summarized.--Fred Gibson.

Management: Harvest, muskrat

Presnall, Clifford C. The Provincial muskrat project at The Pas, Manitoba, Canada, Pittman-Robertson Quarterly (Fish and Wildlife Service, Dept. of the Interior, Chicago, Ill.), 2(2), April 1942, pp. 63-69.

In recent years Manitoba has begun an experiment in the use of 13-1/2 million acres of public lands for fur production and community rehabilitation. It involves: complete governmental control; low development and administration costs; controlled cooperative harvesting and marketing of the wildlife crop; and compulsory insurance against crop failure and market depression. It is not fur farming but management use of natural products of the wilderness. Badly depleted areas are being protected and restocked and tracts with a fair residual population are being put under management. A registered trap-line plan that has proved so successful in British Columbia as to warrant extension is briefly described and the muskrat project mentioned in the title is discussed in greater detail. It has been improved with water intake and outlet structures and patrol cabins. Inventory is taken by multiplying the number of occupied winter lodges by five. The number of trappers is set in accordance with the inventory and trapping of from 60 to 90 percent of the animals inventoried is permitted. The various factors are so managed that the trappers receive about $27.50 net per month throughout the year. They are also aided in getting equipment and supplies. They are organized into camps of 5

to 8 men each under a head trapper and are regularly visited by patrolmen. Trapping and sale regulations are specified. Under management, the muskrat population and the catch have greatly increased. The 1941 take was 191,000 skins, which brought an average price of $1.88. Extension of the Canadian systems to certain areas in the United States and Alaska is recommended.

Management: Hedges

McGraw, Charles F., and Joe R. Davidson. Osage-orange plantings, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(12), June 1942, p. 303.

Osage-orange hedges, once popular, were largely uprooted. They have great utility to wildlife; other values are pointed out.

Management: Inventory, big game

Rush, William Marshall. Wildlife census, American Forests (919 Seventeenth St., N. W., Washington, D. C. 50 cents a copy), 48(1), Jan. 1942, pp. 20-23, 48, illus.

With introductory allusions to the methods of timber cruises and grazing surveys, the author discusses game estimates. Early attempts were crude, and improved methods hardly do away with numerous variables that prevent accurate conclusions. Instances from the experience of the writer and others are cited. Even the best of counts may be 100 percent too low or too high. The writer's advice is to stick to actual counts and eschew estimates.

Management: Inventory, pheasants, etc., Ohio

Hicks, Lawrence E. Status of Ohio game birds, 1940, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 152, 35 pp., (mimeographed), 1 map, figs., tables, Aug. 1941.

The map shows pheasant population densities over the State from 0 to 300+ per square mile. The higher levels according to a second figure giving details reach a maximum of 612. Summaries of the results of pheasant and rabbit hunting, of State-supervised hunting, and of pheasant band returns are given. The principal feature of the paper, the 1940 summer pheasant survey, occupying 24 pages of the leaflet, is summarized in as many brief paragraphs. It contains incidental references to other game birds, crows, hawks, and rabbits.

Management: Inventory, pheasants, etc., Ohio

Hicks, Lawrence E., Daniel L. Leedy, and Don H. Strode. The 1941 September pheasant survey, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 170, 24 pp., figs., tables (mimeographed), Dec. 1941.

An average population of 183 birds per square mile was indicated. Most birds were seen between 6:30 and 7:10 a.m., and 5:05 and 5:45 p.m. Conditions for observing were usually best on clear, quiet mornings when there was heavy dew and relatively little fog. Sex ratio of all birds observed and

sexed, 48.8:51.2. Mortality was at the rate of 24.55 per 1,000 miles, on highways, and 573, on railways. In addition, 128 rabbits and 383 other vertebrates were found dead per 1,000 miles of railroad. Notes on the frequency of rabbits, bobwhites, Hungarian partridges, crows, and hawks also are included. Cover preferences, brood size, and nesting mortality also receive consideration.

Management: Muskrat

Ruhl, H. D., and Luther L. Baumgartner. Michigan's "million dollar" muskrats, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 11(8), Sept. 1942, pp. 6-7, 11, 5 photos.

Muskrats supply more than half of the State's annual crop of raw furs, which is valued at $2,000,000. In early days pelts brought only 10 to 25 cents apiece but in 1919-21, prices went up to $5 to $6 for a single skin. Restrictions on trapping were necessitated by 1926. A muskrat "farming" boom resulted in much disappointment because attempts were made to raise the animals in many unsuitable places. Highest production occurs on natural cattail marshes of Saginaw River and Bay and Lake Erie, where the average acre supports 4 trappable muskrats. Fall trapping is preferred as it harvests many animals that would not survive the winter. Farmers, unskilled laborers, and boys do most of the trapping. Primeness and color are not given so much weight now as formerly, as developments in processing enable manufacture of high quality fur products out of average pelts. The important characteristics of quality and size in muskrat furs are listed. Some income is received from sale of carcasses for food. The life equation of the muskrat in Michigan is explained; the average production per pair is 2-3 litters of about 8 young each. The problem of muskrat management is to conserve as many as possible of these until they can be profitably harvested. Management suggestions are made.

Management: Overpopulations, deer

Edwards, Oliver T. Survey of winter deer range, Malheur National Forest, Oregon, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 210-220, 2 pls., 3 figs., 2 tables.

Author's summary: "(1) The most important units of the deer winter range on the Malheur National Forest in Oregon are seriously overpopulated; (2) the browse on these areas is damaged severely, and their productivity and carrying capacity have been greatly reduced; (3) an immediate reduction in the deer herd is essential to prevent further reduction of the range capacity and future winter losses of deer; (4) elimination of either livestock or deer from the national forest range would not solve the present deer winter range problem; (5) the future game-producing capacity of the land on and adjoining the Malheur National Forest is dependent upon efficient management of the area."

His recommendations are: "(1) Abolish existing refuges; (2) remove the surplus deer through special hunting seasons by allowing the kill of both sexes and in adequate numbers (3) invest the State Game Commission with authority to provide special hunting seasons, bag limits, and sex selection at reasonable license fees; (4) continue present efforts to improve range manage-

ment; (5) continue range investigations to determine effects of control measures; (6) Conduct an educational campaign to inform the public of the existing conditions and the necessity for drastic corrective measures; (7) maintain close cooperation between all individusls, organizations, and agencies who have any responsibility in the management of the game resource."

Management: Planting for wildlife

Dorer, Richard J. Permanent food and cover plantings for Minnesota game birds, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 4(23), Aug. 1942, pp. 10-12.

Drifting snow drives game birds out of coverts in certain situations. More numerous and more widely distributed plantings, therefore, should be made. Suggestions are given as to woody plants suitable for spring and fall planting, and as to their care.

Management: Planting for wildlife and erosion control

Kell, Walter V., and Roland McKee. Cover crops for soil conservation, U. S. Dept. of Agriculture Farmers' Bul. 1758 (Supt. of Documents, Washington, D. C. 5 cents a copy), 14 pp., 10 figs., 1 table, revised Sept. 1942.

Although making little mention of wildlife, this publication will be of value to managers who may desire to make use of clovers, vetches, kudzu, and Lespedeza sericea, besides cereal and forage grasses employed as cover crops. It makes suggestions as to the regions of their adaptability and as to their cultivation.

Management: Pond

Telford, H. S., and O. A. Stevens. Uses and management of ponds and lakes, North Dakota Agr. Expt. Sta. (Fargo), Bul. 313, 40 pp., 14 figs., 7 tables, May 1942.

A contribution to the literature of the fast developing farm pond program. Uses of ponds for cattle watering, fish, fur animal, and wildfowl production, and recreation are pointed out and suggestions made as how they may be forwarded. A survey is presented in text and tables of the chemical, physical, and biological characteristics of 19 widely distributed lakes of the State. There is a list of 19 selected references, which surprisingly, does not include U.S. Dept. of Agriculture, Technical Bul. 221, Wild-duck foods of North Dakota Lakes, 71 pp., 14 tables, 1931.

Management: Refuges

Gabrielson, Ira N. Mysterious Okefenokee, Nature Magazine (1214 Sixteenth St., N. W., Washington, D. C. 35 cents a copy), 35(9), Nov. 1942, pp. 483-486, 2 photos.

Description of this swamp, its fauna, and its management.

Management: Refuges

Kauffman, Erle. Wildlife is taking it, American Forests (919 Seventeenth St., N. W., Washington, D. C. 50 cents a copy), 48(6), June 1942, pp. 198-201, 237-238, illus.

Analysis of the situation resulting from the diversion of a million acres of national wildlife refuge lands to military purposes. The author's data are from refuge managers and other officials of the Fish and Wildlife Service and the conclusions are that areas of high wildlife values have been spared and that on those which have been taken over, surprisingly little damage to wildlife is being done.

Management: Refuges, Cape Romain

Lofton, John M., Jr. Southern sanctuary, American Forests (919 Seventeenth St., N. W., Washington, D. C. 50 cents a copy), 48(1), Jan. 1942, pp. 10-14, 48, illus.

History of the region, and description, illustration, and appreciation of the Cape Romain National Wildlife Refuge (including Bull's Island), S. C.

Management: Songbird

Terres, J. K., and E. C. Murdoch. Birds and conservation, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(12), June 1942, p. 303.

Instances of increase in songbird populations where soil conservation has been practiced in northeastern States. Hedgerows, with a pair to about each 100 feet, have the greatest densities of birds of any habitat, equivalent to 30-50 pairs of nesting birds per acre. Woodland protected from grazing ranks next to hedges.

Management: Squirrel

Chapman, Floyd B. More squirrels in Penn's woods, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(3), June 1942, pp. 5, 30, 32, 2 photos.

Lack of den trees and of a dependable all-year food supply are the chief limiting factors on squirrel populations. Where waste corn is available, installation of nest boxes may greatly encourage squirrels. In extensive woodlands, providing both artificial dens and feeders may be necessary. Winter feeding may increase the animals' resistance to disease and thus reduce population fluctuations. Suggestions are given as to increasing the food supply and regulating hunting. Bibliography of 5 titles.

Management: Stocking, partridge, chukar

Blair, Frank D. The chukar partridge in Minnesota, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 4(21), June 1942, pp. 16-20, 1 pl.

From 1937 to 1941, nearly 50,000 chukars, mostly reared on a State game farm, have been liberated. They appear to be establishing themselves except on prairies of the western and southwestern parts of the State. Continuous stocking is credited with the success achieved; the release of an additional 15,000 birds in 1942 was planned. Notes on habits, including choice of food, are given. In captivity up to 86 eggs have been obtained in a season from a single female. The most important enemy of stocked birds is the house cat.

Management: Stocking, turkey

Mosby, Henry S. Successful turkey restocking is possible, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Richmond. 10 cents a copy), 5(2), Spring-Summer 1942, pp. 69-78, 6 photos, 1 map, 2 tables.

More than 6.0 percent of the releases of wild turkeys under the Virginia plan have resulted in establishment of the birds. Development of the plan is traced. Turkey hens reared in captivity are mated with wild gobblers, and the young produced are released in large areas of formerly occupied range where they are fully protected. Where a seed stock persists, management to increase it is preferred to restocking. The tables and map give details of the effort and its results, which all difficulties considered, are deemed satisfactory.

Management: Swallow, Cliff

Buss, Irven O. A managed cliff swallow colony in southern Wisconsin, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(3), Sept. 1942, pp. 153-161, 3 photos.

Cory Bodeman of Deerfield, Wisconsin, succeeded in increasing a single pair of cliff swallows (Petrochelidon a. albifrons) to a colony of more than 4,000 birds in 38 years. Killing English sparrows, providing sources of mud and horizontal strips to give foundations for nest building, and removing old nests (reducing parasitization) were steps taken to aid the birds. Life history notes and chronology of the colony are included. Bibliography of 8 titles.

Management: Transplanting

Cramer, Wilbur M. The 1940-41 game trapping and hunting program, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(2), May 1942, pp. 8, 27, 2 photos, 5 tables.

Trapping of animals chiefly for transplanting was carried on under permit by three groups, one of which was not paid, one received so much per head of game handled, and the third was paid a per diem rate. Animals trapped in largest numbers were: rabbits (32,799), ring-necked pheasants (2,912), and gray squirrels (600). Figures are given for 9 additional groups. The average cost of trapping rabbits was .468 cents per head.

Management: Transplanting antelopes

Anon. Rehabilitating the pronghorn, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(6), June 1942, pp. 1-3, 17, 4 photos.

Wyoming has 35,000 antelopes but with the animals properly distributed could easily support 60,000. This article describes the traps, trapping methods, and shipping operations that were employed in efforts at distribution.

Management: Transplanting antelopes

Fisher, Lee William. Live trapping Texas antelopes, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 231-236, 4 pls., 2 figs.

A total of 467 antelopes were trapped, sexed, aged, weighed, ear-tagged, and released, with a loss of only 3 animals; trapping operations covered 43 days. Approximate cost for trapping and transporting each animal was $4.30. The trap and shipping crates are described and illustrated. Author's summary: "Modification in the live-trapping technique for antelope are reported, including replacement of horsemen by an airplane for drifting the animals into the trap and removal of antelopes from the crowding pen in a group, rather than one at a time through a chute. They have permitted the use of a simplified and less expensive trap, and afforded a safer, more efficient, and more economical method of capturing antelopes."

Management: Transplanting beavers

Couch, Leo K. Trapping and transplanting live beavers, U. S. Dept. of the Interior, Conservation Bul. 30 (Supt. of Documents, Washington, D. C. 10 cents a copy), 20 pp., 15 figs., 1942.

Supersedes U. S. Dept. of Agriculture Farmers' Bulletin 1768. Treats beavers in relation to soil and water conservation and to fur animals and fishes; losses to agriculture caused by beavers; trapping, transporting, and planting the animals; and the beaver as an asset in rural sections.

Management: Transplanting deer

Anon. Rehabilitating the deer, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(8), Aug. 1942, pp. 1-3, 2 photos.

Seven-foot panel fences protected haystacks but as it did not seem advisable to fence all haystacks, plans were made to remove the excess deer. The traps and trapping methods used are described.

Management: Turkey

Anon. The wild turkey in Virginia, Virginia Commission of Game and Inland Fisheries (Richmond), iv+45 pp., illus., June 1942.

Technical information furnished by Henry S. Mosby and C. O. Handley. History of the wild turkey in Virginia; the greatest decline occurred between

1890 and 1910. Some degree of restoration has been accomplished and the birds now live in 69 of the State's 100 counties and muster a total fall population of about 23,000. Nearly 35 percent of these are removed by hunting, the methods of which are described. Coloration is fully discussed, especially as distinguishing wild and domestic strains. Weights are given for sex and age classes, life history is briefly treated, and there are sections on range requirements, enemies (man the worst), protection, habitat management, artificial propagation, and restocking. The part on management is the most detailed of all in the publication. It deals with competition of livestock and deer with turkeys, plantings, winter feeding, refuges, food patches, and forestry practices in relation to wild turkey production.

Management: Water levels

Frellsen, Sidney A. Control of surface waters, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 5(25), Oct. 1942, pp. 26-33, 3 pls.

"Minnesota has the largest water surface of any state--more than 3,800,000 acres." Water control, a subject of State legislation, is described and illustrated and its advantages summarized. "Judicious control of lake levels will: (1) Supply our streams with a more continuous flow of water, promoting human comfort and creating more healthful sanitary conditions by decreasing the effects of stream pollution; (2) raise ground water levels, thus increasing the dependability of well water supply for farms and communities; (3) retard excessive runoff during flood periods; (4) keep water levels at a more nearly constant elevation; (5) encourage replenishment of fish life by restoring or maintaining natural spawning grounds through maintenance of uniform water levels as nearly as practicable; (6) benefit water fowl and other wild life habitats; (7) enhance scenic beauty; (8) increase tourist trade and encourage water sports; (9) improve conditions for wild rice production."

Management: Waterfowl food plants

Provost, Maurice W. New Hampshire waterfowl reconnaissance, New Hampshire Fish and Game Dept., Tech. Circ. 10 (Concord. 25 cents a copy), 75 pp., tables.

The waterfowl of the State are listed and their status indicated; the food plants are evaluated according to original formulas. The occurrence and importance of the plants are summarized in tables. Improvement possibilities for numerous bodies of water are discussed and estimates made of the costs. Descriptions of the more important wildfowl areas and recommendations for their improvement are given in detail (19 pp. for Lake Umbagog, for instance). Bibliography of 24 titles.

Management: Woodcock

Studholme, Allan T. American woodcock, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(7), Oct. 1942, pp. 12-13, 31, 2 figs.

Distribution, migration, food, and nesting habits are discussed, and favorable environment described in this popular article. An account is given of trapping experiments in Pennsylvania and Maine, and suggestions made for woodcock management. Bibliography of 8 titles.

Natural History: Bats of Minnesota

Rysgaard, G. N. A study of the cave bats of Minnesota with special reference to the large brown bat, Eptesicus fuscus fuscus (Beauvois), American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 28(1), July 1942, pp. 245-267, 8 figs., 1 table.

Description of the caves and of the methods of study; account of the author's findings for 4 species; key to the bats of Minnesota (7 spp.); and two-page bibliography. Migrations to the caves, behavior there, departure, enemies, and parasites are discussed. Considering the dearth of information on the life history of bats, this is a welcome paper.

Natural History: Birds of North Carolina

Pearson, T. G., C. S. Brimley, and H. H. Brimley. Birds of North Carolina (North Carolina Dept. of Agriculture, Raleigh. $3.50 a copy), xxxii+416 pp., 4+37 pls. (20 col.), 1+141 figs., 1942.

Revision of the original work of 1919, with illustrations by Rex Brasher, R. B. Horsfall, and R. T. Peterson. Extra plates at the beginning portray the three authors, and the Governor of North Carolina and the Commissioner of Agriculture under whose administration the book was issued. The introduction sketches the history of bird study and protection in North Carolina. The main text gives a description, statements of general and local ranges, account of habits, and notes on North Carolina occurrence of each form; 396 species and subspecies are included. There is a summary of 57 years' records of bird migration at Raleigh, by C. S. Brimley and a note on bird banding by H. T. Davis. Bibliography of 21 pages.

Natural History: Birds of the Northwest

Booth, Ernest S. A field guide to the birds of eastern Washington, eastern Oregon, and Idaho (The author, Walla Walla College, College Place, Wash. 50 cents a copy), 43 pp., 3 pls., 1 fig.

The key includes brief notes on habits and distribution. A field record is in effect a check list with accompanying space for the entry of observations.

Natural History: Birds of Seattle area

Larrison, Earl J. A field guide to the birds of the Seattle area, Seattle Audubon Society (Seattle, Wash.), 32 pp., 1942.

Preliminary matter includes description of the territory, hints on birding, and directions for using the guide. The species are treated in two major assemblages water, and land, birds, and the latter group in two cate-

gories, namely those larger than, and those equal to or smaller than, the robin. Descriptions are confined to field characters; notes are treated with some detail, being usually syllabilized; and local distribution is indicated.

Natural History: Birds of Washington

Slipp, John W. The tube-nosed swimmers of Puget Sound, The Murrelet (Martha R. Flahaut, Museum Bldg., University of Washington, Seattle. 50 cents a copy), 23(2), May-Aug. 1942, pp. 54-59.

Author's summary: "The Procellariiformes as a group are the most thoroughly pelagic and perhaps the least known of Washington birds. Only one species, Puffinus griseus, was recorded on Puget Sound prior to the unprecedented flight of November and December, 1941, when three species, Puffinus tehuirostris, P. griseus, and Oceanodroma leucorhoa beali, penetrated to the head of the Sound, the first two in large numbers. It is considered that the flight of shearwaters was composed of juvenile and otherwise nonbreeding birds drawn into the Sound by a combination of food and climatic factors, and detained there by the complex topography of the area." Their habits, particularly their feeding on herrings, are described. Bibliography of 10 titles.

Natural History: Birds of western States

Peterson, Roger T. A field guide to western birds (Houghton Mifflin Co., 2 Park St., Boston, Mass. $2.75 a copy), xviii+240 pp., 46 pls. (6 col.), 48 figs., 1941.

After much special preparation and with a great deal of specifically acknowledged cooperation, Peterson has prepared a work that should be as practical and as much appreciated in its field as is his earlier guide to eastern birds. The publishers have done their part in getting out a neat, well printed, and beautifully illustrated volume. An introductory chapter tells how to use the book and two at the end contain, respectively, reference suggestions and a discussion (and annotated list) of subspecies, which quite properly are declared for the most part not subjects for field identification. The author's remarks on subspecies are wholesome and just what are needed in the present state of development of American ornithology (See also a paper, "Thoughts on subspecies," Scientific Monthly, 53, pp. 368-371, Oct. 1941). The main text of the work is made up of compactly written descriptions of the species, putting emphasis on the most diagnostic characters, especially those observable in the field. These are also fully illustrated. Brief statements of ranges are provided.

The reviewer has no adverse criticism to make of the book, but does object to references on the jacket to "the Peterson method of field identification," and to "Peterson's already famous system of identification which emphasizes the distinguishing characteristics of birds when seen at a distance." It seems a little late to be christening a system, part of which every American ornithologist has had to work out for his own territory. Some, not ornithologists, to wit, the old-time market gunners, had even superior "systems" for the birds they dealt with, recognizing wild fowl by their flight mannerisms when they were so distant as to appear by flocks like clouds of

smoke, or as individuals, like motes, in the sky. The unfortunate jacket excerpts noted are certainly not to be attributed to the author as he refers to Ludlow Griscom as one "who has brought the science of field identification to its greatest perfection." Expertness, as Peterson says, "is a matter of seeing a bird often enough" and that is the reason the market gunners could beat any ornithologist at long range identification of waterfowl.

Natural History: Herpetology of Illinois

Cagle, Fred R. Key to the reptiles and amphibians of Illinois, Contr. No. 5, Museum of Natural and Social Sciences, Southern Illinois Normal University (Carbondale, Ill.), 32 pp., 3 pls., 66 figs., 1941.

Comprehensive key with numerous neat illustrations, also a bibliography and glossary. This author has published a full account of the "Herpetological fauna of Jackson and Union Counties, Illinois," in the American Midland Naturalist (Notre Dame, Ind.), 28(1), July 1942, pp. 164-200, 13 figs., tables.

Natural History: Herpetology of Missouri

Anderson, Paul. [Herpetology of Missouri], Kansas City Museum Science Bulletin (3218 Gladstone Blvd., Kansas City, Mo.), 8 foolscap pp. (processed), 1942.

Keys to 10 species of lizards, 14 of turtles, and 36 of amphibians.

Natural History: Herpetology of the Northwest

Booth, Ernest S. Field key to the amphibians and reptiles of the Northwest (The author, Walla Walla College, College Place, Wash. 35 cents a copy), 21 pp., 18 figs. (processed), 1942.

Check list and illustrated key to 23 forms of amphibians and 21 of reptiles; there are also partial keys to the eggs and larvae of the batrachians, directions for collecting and preserving specimens of both phylas, and a glossary.

Natural History: Mammals, Marine

Scheffer, Victor B. A list of the marine mammals of the west coast of North America, The Murrelet (Martha R. Flahaut, Museum Bldg., University of Washington, Seattle. 50 cents a copy), 23(2), May-Aug. 1942, pp. 42-47.

This chiefly nominal list includes 43 species of 12 families of marine mammals found in coastal waters from Panama Canal to Attu Island and Bering Strait. Both common and scientific names are given. Bibliography of 23 titles.

Natural History: Mammals of Washington

Booth, Ernest S. Field key to the mammals of Washington (The author, Walla Walla College, College Place, Wash. 75 cents a copy), 72 pp. (processed), 1941.

Besides matter descriptive of the animals, the key contains brief notes on their distribution. Appendixes relate to the study, preservation, and labelling of mammals, and include a brief bibliography and glossary.

Natural History: Mammals of Wood Buffalo Park

Soper, J. Dewey. The mammals of Wood Buffalo Park, northern Alberta and District of Mackenzie, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(2), May 1942, pp. 119-145, 2 pls., 1 map.

Annotated list of 46 species and subspecies. Bibliography of 16 titles.

Natural History: Plants of Arizona

Kearney, Thomas H., Robert H. Peebles, and collaborators. Flowering plants and ferns of Arizona, U. S. Dept. Agr. Misc. Publ. 423 (Supt. of Documents, Washington, D. C. $2.00 a copy), 1069 pp., 30 pls., 1 fig. (map), 1942.

Introductory matter includes: list of collaborators, statement of the plan of the work, note on botanical exploration of Arizona, discussion of geographical relationships of the flora, and an ecological essay on the vegetation of the State. The systematic section includes: keys to all groups, and leading synonymy, and statement of distribution of the species, about 3,200 in number.

Natural History: Reptiles of Washington

Johnson, Murray L. A distributional check-list of the reptiles of Washington, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh, Pa. 75 cents a copy), 1942(1), March, pp. 15-18.

Annotated list of 25 forms. Bibliography of 7 titles.

Natural History: Shrew, poisonous

Pearson, Oliver P. On the cause and nature of a poisonous action produced by the bite of a shrew (Blarina brevicauda), Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(2), May 1942, pp. 159-166, 2 tables.

Refers to earlier prevalence and decline in the belief that shrews are poisonous, and gives an account of the author's experiments which are summarized as follows: "(1) A poisonous extract has been prepared from the submaxillary salivary glands of the shrew, Blarina brevicauda; (2) a toxic material is also present in the saliva and may be introduced into wounds made by the teeth; (3) the toxic effect of the extract is characterized by a local reaction, lowering of the blood pressure, slowing of the heart, and inhibition of respiration; (4) a lethal dose for a 20-gram mouse is provided by the extract of 5.7 mg of fresh submaxillary tissue when injected intraperitoneally, or of 0.4 mg by intravenous injection. The lethal dose for rabbits injected intravenously is extract of approximately 7 mg per kilogram of body weight;

(5) the toxic material is soluble in water and salt solution, but not in acetone. Heating to 100° C. in neutral or acid solution does not abolish the toxic effect. Similar heating in basic solution destroys the effect; (6) injection of large amounts of extract of the parotid salivary glands of Blarina produces no serious effect on mice, cats, or rabbits; (7) salivary glands of Sorex, Scalopus, Peromyscus, and Microtus have also been tested. Slight toxic effects were noted in some cases, but not comparable to those produced by the submaxillary glands of Blarina."

Natural History: Snakes

Schmidt, Karl P., and D. Dwight Davis. Field book of snakes of the United States and Canada (G. P. Putnam's Sons, New York, N. Y. $3.50 a copy), xiii+365 pp., 34 pls. (4 col.), 103 figs.

Introductory chapters relate to the place of snakes in nature; folklore of snakes; history of the study of snakes in the United States (embellished with portraits of 8 prominent students of these animals); definition and classification of the group; external characters and coloration; poison apparatus and the treatment of snake bite; habits and behavior; and collection, preservation, and study of snakes. The systematic account includes illustrated keys to all groups and forms, appropriate descriptive matter for the families, genera, and species (and their subdivisions), together with statements of ranges. References are given to other leading sources of information and to regional works on snakes. A workmanlike and practical book well-adapted to its purpose.

Natural History: Speciation in Junco

Miller, Alden H. Speciation in the avian genus Junco, Univ. Calif. Publ. in Zoology, 44(3) (University of California Press, Berkeley. $3.00 a copy), pp. 173-434, 33 figs., 37 tables.

While the author says that the prime object of his paper is not nomenclatural or taxonomic, he has assembled in it all the information that a systematist would need for revision of the genus. The bulk of the work consists of description of the characters of each recognized form of Junco, with statistical treatment of their variability and appraisal of their dependability in showing relationships. Nine species, three of them with 4, 8, and 3 subspecies, respectively, are recognized. In summary discussion, the author treats of intra- and inter-racial, and environmental correlation of characters, degree of variability, kinds of inheritance, sexual differentiation, phylogeny, interrelationships of the forms in nature, and the formation of species. Complete synonymy, a list of the breeding specimens examined, and a bibliography of 8-1/2 pages also are included. A comprehensive and critical work that may well be taken as a revision. Somewhat deplorable is employment of the foreign terms artenkreis and rassenkreis. If no English equivalents of these existed, it would be better to invent words harmonious with the genius of the language, but the probability is that we already have terms of the same meanings that are definitely preferable. Species or race chain, complex, or group are possibilities, and in some cases the foreign terms signify nothing more than subgenus or species at their full meanings.

Natural History: Wildlife of Idaho

Rush, Wm. M. Wildlife of Idaho (Fish and Game Commission, Boise), 299 pp., illus., 1942.

Popular, often personified, account, chiefly of species of interest to the trapper, hunter, and angler. Prepared for use in the schools of the State. Ten thousand copies are being distributed free but replacements are to be paid for.

Pollution

Peterson, Roger T. Birds and floating oil, Audubon Magazine (1006 Fifth Ave., New York, N. Y. 35 cents a copy), 44(4), July-Aug. 1942, pp. 217-224, 5 photos.

The wartime sinking of tankers and other ships has increased oiling hazards for birds but nothing can be done about it. Earlier progress in control of oil pollution is reviewed. Recent reports of extensive mortality are cited, and suggestions made as to restorative treatment of oiled birds.

Predation: On grouse, sage

Allred, Warren J. Predation and the sage grouse, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(1), Jan. 1942, pp. 3-4, 2 photos.

Of 21 nests located, 17 or 80.9 percent were destroyed: 23.8 by ravens, 14.3 by coyotes; these predators probably were implicated in the destruction of still other nests. On a protected area the grouse are decreasing, probably due to predation.

Propagation: Feeding bobwhite chicks

Nestler, R. B., W. W. Bailey, and Harold E. McClure. Protein requirements of bobwhite quail chicks for survival, growth, and efficiency of feed utilization, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(3), July 1942, pp. 185-193, 1 pl., 5 figs., 13 tables.

Authors' summary and conclusion: "During the summer and fall of 1939 four experiments were conducted at the Patuxent Research Refuge, Bowie, Maryland, to determine the protein requirements of bobwhite chicks. A total of 816 chicks were used to compare six levels of protein, namely 22, 24, 26, 28, 30, and 32 per cent. From the three standpoints of survival, rate of growth, and efficiency of feed utilization for the first ten weeks of life, the 28 per cent level of protein gave the best results. During the ninth and tenth weeks, the highest efficiency of feed utilization was obtained on the 22 per cent level. The results indicate that after the birds have reached about two-thirds of their mature weight, the difference in efficiency between a diet containing 28 per cent of protein and one containing 22 per cent may be small enough to justify, in the interest of economy, the use of a diet containing the lower percentage of protein." Bibliography of 6 titles.

Propagation: Waterfowl

Mack, H. G. Observations on the raising of waterfowl in southern Ontario, Canadian Field-Naturalist (C. H. D. Clarke, National Parks Bureau, Ottawa, Canada. 25 cents a copy), 56(4), April 1942, pp. 48-49, 2 pls.

Notes the feeding, housing, and protecting from predators of captive waterfowl, chiefly geese.

Research: Areas in national parks

Kendeigh, S. Charles. Research areas in the national parks, January 1942, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(2), April 1942, pp. 236-238.

Brief descriptions of 28 such areas in 10 national parks.

Research: Bird banding

Meyer, Henry, and Dorothea Meyer. Some values of bird-banding, The Migrant (Alfred Clebsch, 838 Gracey Ave., Clarksville, Tenn.), 11(4), Dec. 1940, pp. 89-91.

Advantages pointed out with respect to observation of: plumage changes, constancy of flock to winter feeding grounds, sex ratios among song birds, regional population, variation in behavior, and to development of community interest in bird life.

Research: Climbing method

Mitchell, Kenneth A. Tree climbing techniques, Ohio Conservation Bul. (1106 State Office Bldg., Columbus, Ohio. 10 cents a copy), 6(10), Oct. 1942, pp. 4-5, 8 photos.

With climbing irons and ropes.

Research: Food habits

Dalquest, Walter W. Potassium hydroxide (KOH) as an aid in food habits research, California Fish and Game (Terminal Island, Calif.), 28(2), April 1942, pp. 125-126.

Very useful in softening scats and separating diagnostic elements; also serves the latter purpose in stomach contents of mixed insect fragments and vegetable debris.

Research: Hair identification

Hardy, Thora M. Plitt, and John I. Hardy. Types of fur fibers, Journ. Heredity (32nd St. & Elm Ave., Baltimore, Md. 35 cents a copy), 33(5), May 1942, pp. 191-199, Figs. 11-15.

Methods of study and mounting media are discussed, and types of hairs are described and illustrated. Authors' summary: "For the microscopic examination of fur fibers two colorless media (synthetic plastics) have been found useful for permanent mounts, and two liquids for temporary mounts. Study of the pigmentation or of the cuticular scales may be favored by choice of refractive indices. Microscopic examination of prime silver fox and of mink pelts led to the conclusion that three main types of fibers contribute materially to the quality of furs. These are the underfur fibers, the regular guard hairs, and the 'single' guard hairs. The three types of hairs were studied for general characteristics, such as relative lengths, form and color, as well as specific characteristics, such as the features of their surface structure and relations to each other in the follicles. Specialized hairs are present in the tail gland and in a tuft near the navel. Impressions of the surface structure of the fibers were made on thermoplastic films by a modification of the original method. This modification was necessary to prevent the crushing effect on the thicker fibers. These impressions reveal features of surface structure in certain parts of the hairs that are characteristic for certain types of fibers and for different species of animals." Bibliography of 8 titles.

Research: Sampling vegetation

Canfield, R. H. Sampling ranges by the line interception method, Southwestern Forest and Range Expt. Sta. (Tucson, Ariz.), Research Report 4, 28 pp., 7 figs., tables. 1942.

Description of the method, reproduction of forms for recording data, and discussion of their mathematical treatment. The method is adapted to measurement of plant cover, and its composition, density, volume, and degree of use.

Research: Trend

Swanson, Gustav. The trend of wildlife research, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 4(23), Aug. 1942, pp. 24-27.

The trend is toward the solving of practical problems in game administration. Instances are given of actions taken on the basis of deer and pheasant censusing, and of a decision to abandon stocking of Hungarian partridges as a result of a scientific investigation of the results.

Research: Waterfowl management

Zimmerman, F. R. Waterfowl management research, Wisconsin Conservation Bul. (Wisconsin Conservation Department, Madison), 7(9), Sept. 1942, pp. 15-18, 2 photos.

While conditions for waterfowl have improved in recent years, the situation for these birds remains unsatisfactory. Destruction of habitat and excessive shooting, factors that were greatly responsible for reducing the numbers of birds, still prevail. "The committee on bird protection for the American Ornithologists' Union reports that the canvasback, ruddy duck, and

redhead are still in a precarious position as far as numbers are concerned, and the return of the first two mentioned species to the daily ten and twenty bag possession limit was a little premature. Although these two birds have been increasing to some extent, they are still rare or uncommon over large areas of their former breeding range." Improving the habitat for waterfowl and controlling the bag limit are necessary if we are to restore the population to what it formerly was. Physical, chemical, biological, and economic factors that affect the growth of water plants and the restoration of habitats are discussed. The article is a preliminary report upon a federally-aided investigation of waterfowl management.

NOTES AND NEWS

Under an agreement to conserve paper, it was decided to prepare only three issues of WILDLIFE REVIEW during the fiscal year 1942-43.

A number of the abstracts in this issue of Wildlife Review have been prepared by Florence H. Warnick, long-time secretary to Mr. McAtee. She has done all of the typing and stencil cutting of the Review since the beginning and in taking over part of the abstracting will be in training for future preparation of a larger share of the copy.

The Pennsylvania State College School of Agriculture in its 54th Annual Report (Agr. Expt. Sta. Bul. 414, State College, Pa.) for the fiscal year 1941 contains summaries of results in wildlife work relating to the woodcock, turkey, pheasant, bobwhite, and deer, as well as references to publications on wildlife by members of the Cooperative Research Unit and the Department of Zoology and Entomology.

"The sea gull which saved the crops of the early Pioneers from the crickets in 1848 is still helping. Dr. G. F. Knowlton has found that during recent serious outbreaks of grasshoppers and crickets in Utah large numbers of the gulls have been seen feeding on these and other insects, including the cut-worms and white grubs. It has been estimated that this gull gave ninety per cent control of grasshoppers after alfalfa was harvested in one district in 1936." (Science and Discovery, 8(2), Oct. 1942, p. 56.)

The Wisconsin Conservation Bulletin (7(5), May 1942, p. 13) says of the introduced Reeves pheasants that "in certain areas throughout the state they have actually adapted themselves and are in the third generation in the wild."

La Foret Quebecoise (4(8), Oct. 1942, 2 Cote d'Abraham, Quebec, Canada. 15 cents a copy) contains educational articles prepared for 4-H clubs on S

common mammals, the otter, skunk, red fox, beaver, muskrat, woodchuck, red squirrel, and cottontail. Each paper includes matter under the following heads: description, classification and range, life cycle, food and habits. This is a French language publication.

Present conditions have resulted in the practical dissolution of the International Zoological Commission, but need of authority in the field of taxonomic nomenclature has inspired the Entomological Society of America and the American Society of Mammalogists to undertake curative action. Now Dr. W. H. Osgood of the Field Museum, on behalf of the latter society, is attempting to unify these efforts, to organize a substitute for the moribund International Commission, and to revise the International Code. As the objectives include, among other things, the restriction of taxonomic regulation to taxonomists, and counteraction against the ill-advised nomina conservanda, this reviewer hails them as of more promise than anything that has happened in the field of zoological nomenclature since adoption of the A.O.U. Code in 1884.

It may be useful to call to attention a "Botany of the Canadian Eastern Arctic" (Canada Dept. of Mines and Resources, Ottawa, Bul. 92, 1940, vi+408 pp., 6 pls., 2 maps) although it is no longer available from the original source. It embodies much high-grade research over a period of years and the author, Nicholas Polunin, is an expert in the field. The work deals with 400 delimitable plant forms, not one of which apparently has been introduced, the situation thus contrasting strongly with that of more southern lands.

"Notes on the preparation of papers for publication in The Journal of Hygiene and Parasitology," by G. H. F. Nuttall (Macmillan Co., 60 Fifth Ave., New York, N. Y. $1.15 a copy) is of wider usefulness than the title would indicate. The sections on preparation of manuscript and illustrations and on proof-reading are of general application, and especially to be recommended is the chapter on style and wording, which includes valuable hints on the proper use and on the misuse of words, on sentence and paragraph construction, and on punctuation.

Notice has been seen of a book, but not the work itself, entitled "Spontaneous and experimental leukaemia in animals," by Julius Engelbreth-Holm (Oliver and Boyd, Edinburgh & London, 1942. 15 shillings). Apparently the findings deal more with domestic and laboratory, than with wild, animals. Leukaemias are neoplastic in origin.

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